Vol. 1073 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

December 23, 1986

U.S.
DEPARTMENT
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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

December 23, 1986 Volume 1073 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
All cases:	1015.00
International fees	
Basic fee (first 30 pages):	430.00
Basic Supplemental fee (for each page over 30):	8.00
Designation fee for the first 10 national or regional offices:	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Sept. 30, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Dec. 20, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,420,843 through 4,422,182
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENT WHICH EXPIRED OCTOBER 5, 1986 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,352,221	06/259,683	10/5/82
4,352,234	06/223,706	10/5/82
4,352,242	06/273,585	10/5/82
4,352,253	06/243,549	10/5/82
4,352,267	06/221,842	10/5/82
4,352,275	06/258,326	10/5/82
4,352,322	06/255,184	10/5/82
4,352,339	06/227,632	10/5/82
4,352,341	06/251,616	10/5/82
4,352,409	06/226,802	10/5/82
4,352,438	06/233,831	10/5/82
4,352,480	06/230,325	10/5/82
4,352,497	06/215,649	10/5/82
4,352,500	06/229,397	10/5/82
4,352,507	06/247,693	10/5/82
4,352,567	06/272,344	10/5/82
4,352,569	06/272,572	10/5/82
4,352,579	06/255,045	10/5/82
4,352,589	06/284,824	10/5/82
4,352,632	06/231,042	10/5/82
4,352,652	06/246,865	10/5/82
4,352,667	06/241,303	10/5/82
4,352,700	06/218,400	10/5/82
4,352,704	06/271,964	10/5/82
4,352,719	06/230,506	10/5/82
4,352,727	06/255,281	10/5/82
4,352,731	06/220,656	10/5/82
4,352,735	06/259,920	10/5/82
4,352,739	06/262,177	10/5/82
4,352,749	06/235,028	10/5/82
4,352,797	06/280,087	10/5/82
4,352,798	06/283,429	10/5/82
4,352,801	06/218,402	10/5/82
4,352,802	06/268,741	10/5/82
4,352,836	06/255,399	10/5/82
4,352,851	06/217,282	10/5/82
4,352,929	06/268,467	10/5/82
4,352,950	06/226,207	10/5/82
4,352,978	06/308,781	10/5/82
4,352,990	06/243,199	10/5/82
4,352,993	06/300,691	10/5/82
4,352,994	06/261,698	10/5/82
4,353,048	06/305,453	10/5/82
4,353,103	06/252,149	10/5/82
4,353,107	06/234,502	10/5/82
4,353,120	06/250,523	10/5/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,480,293, Re. S.N. 924,403, Filed Oct. 29, 1986, Cl. 362/108, LIGHTED SWEAT SHIRT, Peggy S. Wells, Owner of Record: *PSW, Inc., Sand Springs, Okla.*, Attorney or Agent: Charles S. Cotropia, et al., Ex. Gp.: 340

4,546,296, Re. S.N. 924,920, Filed Oct. 30, 1986, Cl. 318/372, ELECTRIC ACTUATORS, Jack Washbourn, et al., Owner of Record: *Westinghouse Brake and Signal Co., Ltd., Pew Hill, Chipperham, England,* Attorney or Agent: Ross F. Hunt, Jr., et al., Ex. Gp.: 310

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Re. 30,920, Reexam. No. 90/001,123, Requested: Oct. 31, 1986, Cl. 242/152, YARN TENSIONING DEVICE AND METHOD, Otto Zollinger, Owner of Record: *Otto Zollinger, Inc., Spartanburg, S.C.*, Attorney or Agent: None, Ex. Gp.: 240, Requester: Edward J. McBride, Long Pond, Pa.

3,977,091, Reexam. No. 90/001,121, Requested: Oct. 27, 1986, Cl. 165/107, TEMPERING AND STERILIZING DEVICE, Hans Peter Hortig, et al., Owner of Record: *Hoechst Aktiengesellschaft, Frankfurt, Germany,* Attorney or Agent: Curtis, Morris, et al., Ex. Gp.: 340, Requester: Owner

4,236,467, Reexam. No. 90/001,119, Requested: Oct. 29, 1986, Cl. 112/158.6, SEWING MACHINE WITH DISPLAY UNITS WHICH DISPLAY GUIDANCE DATA GUIDING THE USER IN MANUAL ADJUSTMENT OF OPERATING VARIABLES IN AUTOMATIC RESPONSE TO USER SELECTION OF STITCH TYPE, Yoshikazu Tasaka, et al., Owner of Record: *Janome Sewing Machine Co., Ltd., Kyobashi, Japan,* Attorney or Agent: Striker, Striker, et al., Ex. Gp.: 240, Requester: Gary Lonergan, Alexandria, Va.

4,422,338, Reexam. No. 90/001,124, Requested: Nov. 10, 1986, Cl. 73/861, METHOD AND APPARATUS FOR MASS FLOW MEASUREMENT, James E. Smith, Owner of Record: *Micro Motion, Inc., Boulder, Colo.*, Attorney or Agent: Mary Helen Sears, Ex. Gp.: 260, Requester: Owner

4,472,010, Reexam. No. 90/001,120, Requested: Oct. 28, 1986, Cl. 339/8, TWIST-INHIBITING APPLIANCE FOR CONNECTING A CABLE OF A TELEPHONE SET OR THE LIKE, Nickolas G. Parnello, Owner of Record: *Rosenthal Mftg., Inc., Chicago, Ill.*, Attorney or Agent: Leydig, Voit, et al., Ex. Gp.: 320, Requester: Telephone Products, Inc., Wheeling, Ill.

4,550,136, Reexam. No. 90/001,126, Requested: Nov. 21, 1986, Cl. 524/718, METHOD FOR POLYMERIZING METHYL METHACRYLATE, Ludwig Hosch, Owner of Record: *Rohm GmbH, Darmstadt, Germany,* Attorney or Agent: Curtis, Morris, et al., Ex. Gp.: 150, Requester: Owner

4,579,530, Reexam. No. 90/001,125, Requested: Nov. 13, 1986, Cl. 433/223, FABRICATION OF PORCELAIN RESTORATIONS, Gerald G. McLaughlin, Owner of Record: *Yukijo Ltd., Oakdale, N.Y.*, Attorney or Agent: Leonard Belkin, Ex. Gp.: 330, Requester: John M. Collins, Kansas City, Mo.

4,593,064, Reexam. No. 90/001,127, Requested: Nov. 21, 1986, Cl. 524/718, METHOD FOR POLYMERIZING METHYL METHACRYLATE, Ludwig Hosch, Owner of Record: *Rohm GmbH, Darmstadt, Germany,* Attorney or Agent: Curtis, Morris, et al., Ex. Gp.: 150, Requester: Owner

4,596,260, Reexam. No. 90/001,122, Requested: Oct. 29, 1986, Cl. 132/73, ARTIFICIAL NAILS, James T.

Giuliano, Owner of Record: *Zotos International, Inc., Darien, Conn.*, Attorney or Agent: George W. Rauchfuss, Ex. Gp.: 330, Requester: Owner

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Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Horrocks-Ibbotson Co., Utica, N.Y., Reg. No. 551,036, for the mark "HARNELL", Canc. No. 15,704.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 23, 1986

4,157,237	4,584,911	4,601,436	4,610,976
4,338,251	4,585,063	4,601,819	4,611,005
4,422,644	4,585,108	4,602,060	4,611,006
4,432,827	4,587,453	4,602,986	4,611,236
4,437,896	4,587,529	4,603,354	4,611,386
4,451,467	4,588,693	4,603,736	4,611,417
4,456,883	4,588,742	4,604,308	4,611,643
4,457,304	4,588,743	4,604,551	4,611,719
4,466,981	4,588,966	4,605,125	4,612,071
4,469,525	4,591,192	4,605,660	4,612,552
4,469,762	4,591,603	4,606,102	4,613,331
4,501,591	4,591,865	4,606,151	4,613,419
4,503,154	4,591,946	4,606,173	4,613,642
4,505,290	4,592,641	4,606,287	4,613,644
4,506,195	4,592,677	4,606,396	4,613,887
4,523,579	4,592,855	4,606,590	4,614,225
4,535,923	4,593,039	4,606,636	4,614,226
4,544,919	4,593,385	4,607,666	4,614,339
4,550,690	4,593,565	4,608,117	4,614,556
4,552,904	4,594,112	4,608,155	4,614,756
4,553,977	4,594,750	4,608,192	4,614,820
4,559,354	4,595,381	4,608,469	4,615,148
4,560,061	4,595,397	4,608,821	4,615,159
4,563,313	4,595,411	4,608,916	4,615,188
4,572,832	4,595,702	4,608,974	4,615,340
4,573,083	4,597,051	4,609,127	4,616,101
4,575,966	4,598,044	4,609,257	4,616,277
4,576,475	4,598,304	4,609,796	4,616,437
4,577,667	4,599,089	4,609,820	4,616,501
4,578,892	4,599,470	4,610,077	4,617,065
4,580,150	4,599,622	4,610,467	4,617,072
4,580,951	4,600,064	4,610,505	4,617,251
4,582,424	4,600,184	4,610,801	4,618,066
4,582,460	4,601,387	4,610,940	4,619,045

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Connecticut	New Haven: Science Park Library	(203) 786-5000
Delaware	Newark: University of Delaware Library	(302) 451-2965
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1227
	The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF November 8, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-07-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-29-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-15-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-25-85
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-19-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-12-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	2-21-84
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-25-84
DESIGN, GROUP 290—K. L. CAGE, Director	6-13-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-19-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	5-21-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-03-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during November 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,475,765 to 3,480,965, inclusive

Plant Patents ..... Numbers 2,937 to 2,944 inclusive

REEXAMINATIONS

DECEMBER 23, 1986

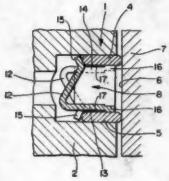
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,429,885 (603rd)

SPACER AND EXPANDER MEMBER FOR HOLDING AND BIASING PISTON RING RAILS

Ko Chiba; Hajime Yamauchi; Yoneo Kawauchi, and Yukio Ikeda, all of Kashiwazaki, Japan, assignors to Kabushiki Kaisha Riken, Tokyo, Japan

Reexamination Request No. 90/000,871, Oct. 2, 1985.
Reexamination Certificate for Patent No. 4,429,885, issued Feb. 7, 1984, Ser. No. 439,177, Nov. 4, 1982.
Filed Oct. 2, 1985, Ser. No. 439,177
Int. Cl.[4] F16J *9/06, 9/20*
U.S. Cl. 277—140



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2** and **3**, dependent on an amended claim, are determined to be patentable.

1. A piston ring assembly comprising a pair of rails having cylinder-engaging rounded faces and a spacer and expander member for holding said rails in axially spaced relation and for expanding said rails radially outwardly, said spacer and expander member being constructed of corrugated sheet metal having upper and lower crowns and connecting portions continuously connecting said crowns, each said upper crown being provided at its inner portion with an arm extending downwardly to engage the inner periphery of said rail supported on said lower crown, each said lower crown being provided at its inner portion with an arm extending upwardly to engage the inner periphery of said rail supported on said upper crown, each said arm [being tapered in width] *tapering inwardly in width toward its tip* are provided at its tip with an enlarged rail receiving portion, said arms extending alternately upwardly and downwardly from said lower and upper crowns and being inclined radially outwardly to provide a resilient spring-like action, the rail receiving portions of said arms being inclined radially inwardly.

B1 4,551,177 (604th)

COMPRESSIBLE STARCHES AS BINDERS FOR TABLETS OR CAPSULES

Paolo C. Trubiano, and James J. Kasica, both of Somerville, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Reexamination Request No. 90/000,987, Apr. 14, 1986.
Reexamination Certificate for Patent No. 4,551,177, issued Nov. 5, 1985, Ser. No. 603,021, Apr. 23, 1984.
Filed Apr. 14, 1986, Ser. No. 603,021
Int. Cl.[4] C08B *31/00*; C08L *3/00*
U.S. Cl. 106—210

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **5–17, 19** and **20** is confirmed.

Claims **1–4** and **18** are cancelled.

[1. A starch, useful as a binder for tablets prepared by direct compression or dry granulation or as a binder-diluent for capsules, which consists essentially of a free-flowing, compressible starch powder derived from a cold-water-insoluble, granular starch base by treatment with an acid, and/or alpha-amylase enzyme, the treatment of the starch base and recovery of the free-flowing, compressible starch powder being carried out at a temperature below the gelatinization temperature of the starch; the treated starch being characterized by altered, weakened non-gelatinized granules with a less dense interior and disrupted surface; the compressible starch powder being capable of forming, under direct compression, a tablet having a hardness of at least 5 kg.]

REISSUES

DECEMBER 23, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

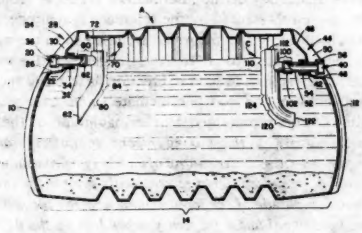
Re. 32,312
INLET AND OUTLET BAFFLE STRUCTURE FOR SEWAGE TREATMENT TANKS

Fred J. Crates; James L. Fouss, and John J. Parker, all of Findlay, Ohio, assignors to Hancor, Inc., Findlay, Ohio

Original No. 4,363,732, dated Dec. 14, 1982, Ser. No. 152,186, May 22, 1980. Application for reissue Dec. 14, 1984, Ser. No. 681,874

Int. Cl.[4] B01D *21/02*

U.S. Cl. 210—532.2 10 Claims



1. A sewage treatment construction for minimizing fluid turbulence from the ingress of incoming sewage, the construction comprising:

(a) a tank for holding sewage for treatment, said tank including a first end wall which includes an inlet for receiving incoming sewage and a second end wall which includes an outlet for discharging treated fluids;

(b) an inlet baffle structure for introducing incoming sewage into the tank, said inlet baffle structure comprising:

(i) a first generally tubular portion which is operatively connected at one end with said inlet;

(ii) a second generally tubular portion having a vent aperture adjacent one end, the second generally tubular portion being in fluid connection with the other end of said first generally tubular portion;

(iii) a third generally tubular portion defining a fluid introducing opening at one end through which incoming sewage is introduced into the tank, the third tubular portion diverging toward the fluid introducing opening such that the flow rate of incoming sewage tends to be slowed as it approaches the fluid introducing opening, whereby turbulence in the tank is reduced; and

(iv) a transition zone providing fluid connection between the other end of said second generally tubular portion and the other end of said third generally tubular portion;

(c) an outlet baffle structure for receiving treated fluid to be discharged from the tank through said outlet, said outlet baffle structure comprising a second generally tubular structure which is in fluid connection with said outlet and which defines a fluid receiving opening through which treated fluids are received for discharge from said tank.

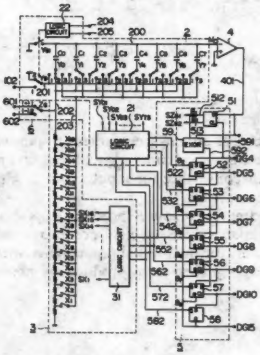
Re. 32,313
DIGITAL-TO-ANALOG CONVERTER AND PCM ENCODER USING THE CONVERTER

Kazuo Yamakido, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Original No. 4,369,433, dated Jan. 18, 1983, Ser. No. 185,991, Sep. 10, 1980. Application for reissue Jan. 17, 1985, Ser. No. 692,197

Int. Cl.[4] H03M *1/46*

U.S. Cl. 340—347 DA 13 Claims



1. A digital-to-analog converter comprising:

a capacitor array circuit including first to eighth capacitors having binary-weighted capacities in ratio, each capacitor having one end thereof connected to an output line, a first common line of a first potential connected to the other ends of said first to eighth capacitors through respective switch contacts of a first switch group, a second common line of a second potential connected to the other ends of said first to seventh capacitors through respective switch contacts of a second switch group, and a third common line connected to the other ends of said first to eighth capacitors through respective switch contacts of a third switch group;

a resistor string circuit including a resistance element connected between said second common line and a source of said first potential, sixteen taps connected to said resistance element at respective points for deriving voltages which correspond to (2n−1)/33 (where n represents a given number of 1 to 16) of a voltage applied across said resistance element, and a fourth switch group including a plurality of switches inserted between said third common line and said taps, respectively; and

logic circuit means for controlling selectively the switching operation of said first to fourth switch groups in dependence on a digital signal to be converted, thereby to produce an analog voltage corresponding to the digital signal from said output line.

Re. 32,314

FREQUENCY CONTROL CIRCUITS SUCH AS FOR USE IN MODULATION MEASUREMENT

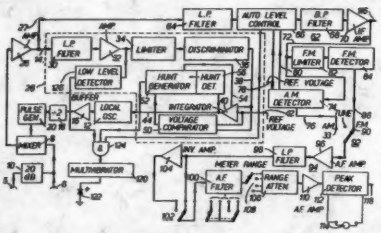
Derek R. Gittins, Wokingham, and Michael D. Gregory, Windsor, both of England, assignors to Racal-Dana Instruments Limited, England

Original No. 3,992,670, dated Nov. 16, 1976, Ser. No. 565,017, Apr. 3, 1975. Application for reissue Nov. 8, 1978, Ser. No. 958,943

Claims priority, application United Kingdom, May 21, 1974, 22510/74

Int. Cl.[4] H04B *17/00*

U.S. Cl. 455—115 14 Claims



1. An electrical circuit arrangement responsive to an input signal whose frequency can vary within a first predetermined range and for converting the input signal to a predetermined frequency, comprising

a variable frequency source producing a variable frequency signal variable over a second predetermined range,

mixing means for mixing the input signal with the variable frequency signal so as to produce an intermediate signal whose frequency varies with the two mixed frequencies so as to maintain a predetermined algebraic relationship with the two mixed frequencies as they vary over their said ranges,

discriminator means responsive to the frequency of the intermediate signal as the input signal and the variable frequency signal vary over their respective said ranges, and operative to produce a control signal whose magnitude is dependent on the frequency of the intermediate signal,

a reference [a] signal source,

integrator means for receiving the control signal and the reference signal so as to produce an integrated error signal which is dependent on the difference therebetween,

means responsive to the magnitude of said integrated error signal to produce a second error signal whose value is dependent on the value of said integrated error signal,

means coupled to said integrator means *and responsive to the second error signal* for increasing the rate at which the mean frequency of the intermediate signal is brought to the value represented by the reference magnitude, and

means for feeding the integrated error signal to the variable frequency source to control the frequency of the variable frequency source in such a direction as to bring the mean frequency of the said intermediate signal to a predetermined value represented by the magnitude of the reference signal[.] *the mixing means comprising sampling means operative under control of and in synchronism with the variable frequency signal to repeatedly sample the instantaneous amplitude of the input signal, whereby the said intermediate signal has a frequency dependent on the difference between the frequency of the input signal and a multiple of the variable frequency.*

PLANT PATENTS

GRANTED DECEMBER 23, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,835
ROSE PLANT

Nelson F. Jolly, Galena, Md., assignor to Jolly's Rosehill Farm of Kent, Inc., Galena, Md.

Filed Feb. 15, 1985, Ser. No. 702,376
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by attractive well-formed buds and flowers of the carrot red to Spanish orange color class displayed on a relatively low growing plant with abundant dark green foliage.

5,836
ROSE PLANT INTERSINA

G. Peter Ilsink, Leersum, Netherlands, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Mar. 11, 1985, Ser. No. 710,591
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—18 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its long stems having few thorns, pointed buds desirable for cutting, pink coloring suffused over white, little fragrance, short peduncles, petalage of approximately 35.

5,837
PISTACHIO TREE

Henry P. Anderson, III, and Kenneth L. Puryear, both of Pioneer Nursery, 800 N. Chester, Bakersfield, Calif. 93308

Filed Jan. 29, 1985, Ser. No. 696,247
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—30 1 Claim

1. A new and distinct variety of pistachio tree (identified as PN-83-F) characterized by a mature tree of rounded upright shape, having several main branches; rapid growth, abundant, leathery foliage, ease of propagation by budding or grafting; and further characterized by the abundant production of female flowers, in clusters, followed by seeds which are especially desirable for planting (when pollenized by the male variety, identified as PN-46-M), said hybrid seeds producing a fast growing, disease resistant tree of value for use as understock upon which to bud or graft commercial nut bearing varieties of pistachio such as 'Kerman'.

5,838
APPLE TREE 'LORIGLO'

Amol O. Akins, Rte. 1, Whitesville, Ky. 42378

Filed Aug. 3, 1983, Ser. No. 495,097
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of apple tree, substantially as shown and described, characterized particularly as to novelty by a unique combination of characteristics, including fruit maturing about two weeks before the Red Delicious with a very attractive appearance and spicy delicious flavor with an attractive red color which is not quite so intense as the Red Delicious.

5,839
PEACH TREE (PRIMECREST)

Georges Carbonnell, Vinca, France, assignor to S.A.R.L. Castang, Gardonne, France

Filed Dec. 24, 1984, Ser. No. 686,132
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—43 1 Claim

1. A new and distinct variety of peach tree, substantially as illustrated and described, characterized in particular by the regular and very productive bearing of semi-freestone fruit which—while similar to the Springcrest in form, color, and size—ripens approximately two and one-half weeks earlier than the Springcrest.

5,840
STRAWBERRY PLANT—'MR. P'

Harold A. Johnson, Jr., and Amado Q. Amorso, both of Watsonville, Calif., assignors to Driscoll Strawberry Associates, Inc., Watsonville, Calif.

Filed Feb. 8, 1985, Ser. No. 699,965
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—49 1 Claim

1. The new and distinct variety of strawberry plant herein described and illustrated and identified by the characteristics enumerated above together with the parts thereof.

PATENTS

GRANTED DEC. 23, 1986

ERRATA

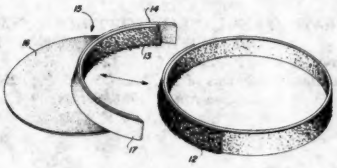
For CLASS	See PATENT NO.
384-045	4,630,872
423-004	4,631,028
540-546	4,631,149
540-310	4,631,150
379-040	4,631,357
379-045	4,631,358
379-324	4,631,359
379-324	4,631,360
379-351	4,631,361
379-384	4,631,362
379-015	4,631,363
379-164	4,631,364
379-167	4,631,365
340-333	4,631,366
379-157	4,631,367
379-029	4,631,368

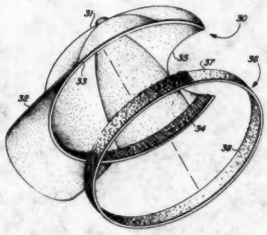
PATENTS

GRANTED DECEMBER 23, 1986

GENERAL AND MECHANICAL

4,630,317
SWEAT BAND APPARATUS
Larry L. Brown, Lantana, Fla., and Jerry H. Lisle, Belleair Beach, Fla., assignors to Larry L. Brown, Lake Worth, Fla.
Continuation of Ser. No. 908,573, May 22, 1978, Pat. No. 4,547,903, which is a continuation-in-part of Ser. No. 672,779, Apr. 1, 1976, abandoned. This application Dec. 31, 1984, Ser. No. 663,200
Int. Cl.⁴ A61F *9/04*
U.S. Cl. 2—12 **6 Claims**

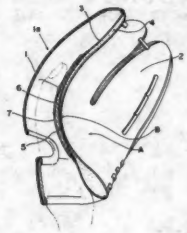




1. A sweat band visor comprising:
(a) a sweat band, at least a portion of which is an elastic, moisture-absorbing fabric and stretchable to fit around the head of a user;
(b) a strip of hook and loop material attached to, and extending around a substantial portion of the outer periphery of said sweat band; and
(c) a sun visor having an elongated arcuate surface curved for fitting adjacent a person's forehead and extending to the side of the forehead of the user, said arcuate surface having a strip of hook and loop material attached thereto about substantially all of the inside periphery of said arcuate surface for attaching to the co-acting hook and loop material of said sweat band, thereby allowing rapid attachment or removal of a sun visor to said sweat band.

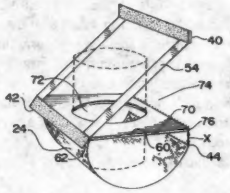
4,630,318
BASEBALL CATCHING MEANS
Akio Aoki, Hirakata, Japan, assignor to Trion Corporation, Japan
Filed Jan. 18, 1985, Ser. No. 692,833
Int. Cl.⁴ A41D *13/10*
U.S. Cl. 2—19 **2 Claims**

1. A baseball catching means comprising:
a front ply defining a ball receiving area and a back face;
a back ply defining a back side of the baseball catching means;
a lining ply disposed over the back face of the front ply, said lining ply defining a back face;
padding means attached to the top the back face of the lining ply; and



a retainer member for attaching the padding means to the lining ply.

4,630,319
ARTICLE HOLDING MECHANISM FOR A GARMENT AND OTHER SURFACES
Lawrence Mathis, 1451-E Willow Lake Dr., Atlanta, Ga. 30329
Filed Oct. 18, 1985, Ser. No. 789,160
Int. Cl.⁴ A41D *27/20*
U.S. Cl. 2—250 **14 Claims**



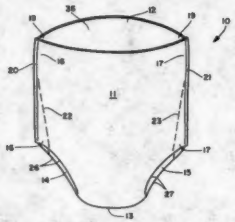
1. A garment having an article holding mechanism comprising:
an outer section having a first edge releasably attached to a first portion of said garment and an opposite second edge pivotably attached to a second portion of said garment for pivotal movement about said second edges, said outer section being movable to an open position in which said first edge is detached from said garment and a closed position in which said first edge is attached to said garment,
a retainer having one edge hingably attached to said first edge of said outer section and a second edge hingably attached to said garment at a position intermediate said first and second portions of said garment;
at least one strap having one end fixed to said first portion of said garment and an opposite end fixed to said first edge of said outer section, said strap having a length sufficient to permit said retainer to extend generally perpendicularly from said garment, said strap being foldably disposed between said outer section and said garment when said first edge of said outer section is fixed to said first portion of said garment; and
support means for retaining said article in said retainer, said support means including an aperture located in said retainer for receiving said article, and a central area of said outer section between said first and second edges, said article being received in said aperture with a base of said article being supported by said central area.

4,630,320

GARMENT WITH ONE OR MORE GUSSETED ADJUSTABLE OPENINGS AND METHOD OF MAKING THE SAME

Paul T. Van Gompel, Hortonville, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 18, 1985, Ser. No. 789,205
Int. Cl.[4] A43B 1/22; A41B 9/04
U.S. Cl. 2—406 **26 Claims**



1. A garment including at least one opening for encircling a portion of a wearer's body and having at the periphery of the opening a gusset fold comprised of disengagably bonded together gusset faces, whereby the opening can be increased in size by manual disengagement of at least a portion of the bonded together gusset faces.

11. A panty-type garment having leg openings and including one or more gusset folds at the leg openings, the gusset folds comprising gusset faces being manually disengagably bonded to one another, whereby the leg openings may be adjusted in use to larger sized legs by manual disengagement of at least a portion of the bonded gusset faces.

18. A method for making a garment having adjustable openings therein for encircling a portion of a wearer's body, comprising the steps of:

providing a garment having one or more of said openings therein;

folding material at said opening to form therein gusset faces providing one or more gusset folds at the edge of said leg openings; and

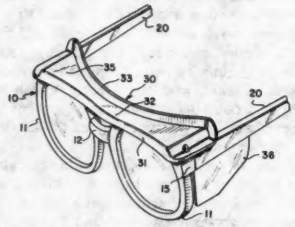
manually disengagably-bonding the gusset faces of a gusset fold to one another.

4,630,321

SAFETY SPECTACLES WITH BROW PROTECTOR

Hans W. Sagemuehl, Cotuit, and Kenneth G. Duffie, Middleboro, both of Mass., assignors to H. L. Bouton Company, Inc., Buzzards Bay, Mass.

Filed Apr. 21, 1986, Ser. No. 854,244
Int. Cl.[4] A61F 9/02
U.S. Cl. 2—426 **6 Claims**



1. A protective spectacle comprising:

(a) a frame including a pair of lens-receiving rims connected by a bridge,

(b) a temple connected to each end of said frame by hinge means,

(c) a brow-protecting bar separate from and extending along the full length of the top of said frame with the ends thereof seated on end portions of said frame, and

(d) means anchoring said bar ends to said frame while leaving the remainder of said bar free of said frame,

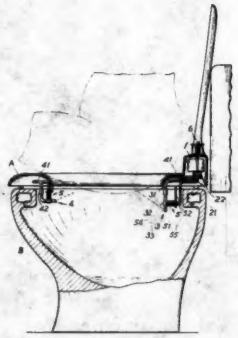
(e) whereby in response to impact on the front of said frame, said frame can move toward the face of the wearer after said bar engages the brow of the wearer.

4,630,322

SPRAYING-ANGLE SELECTOR FOR A TOILET HAVING ADJUSTABLE WATER-SPRAY NOZZLES

Dai-Ming Kuo, P.O. Box 10160, Taipei, Taiwan

Continuation-in-part of Ser. No. 779,833, Sep. 25, 1985. This application Apr. 7, 1986, Ser. No. 849,255
Int. Cl.[4] A47K 3/20
U.S. Cl. 4—420.4 **1 Claim**



1. A spraying-angle selector for a toilet having adjustable water-spray nozzles comprising: a rotating knob having a hollow cylindrical interior wall and being movably mounted in an upper plate, said interior wall formed with two longitudinal keys, each having a lower tapered end, said keys being symmetrically formed on said wall of the knob, said upper plate having an indicating mark formed on the top surface thereof; a stepwise driving element formed as a cylinder and movably jacketed within said cylindrical interior and formed with a set of rightward-inclined teeth and another set of leftward-inclined teeth, both sets of teeth respectively formed on two helically slope-surfaces equally divided on a perimeter of said cylinder of said driving element, each set of teeth being operatively engaged with the lower tapered end of each said longitudinal key in said knob; a driving bellows having its upper end fixed in a disk portion formed on the bottom of said driving element and having its lower end fixed in a socket of a lower plate, said driving bellows being jacketed with a restoring spring therein; and a bottom plate having a bottom hole fluidically communicated with said driving bellows and with a tube which directs fluid from inside said driving bellows to a follower bellows of a spraying-angle adjuster, said bottom plate fixed on a toilet seat or a frame near the toilet and combined with said upper plate by several connecting means linked therebetween, said spraying-angle adjuster operatively adjusting the water spray angle of a rear-side nozzle or a front-side nozzle adapted for spraying either human anus or genitals portion, whereby upon the rotation of said rotating knob engagement of said longitudinal keys with said two sets of teeth will cause said driving element to descend and press said driving bellows to compress the fluid therein to expand the lower

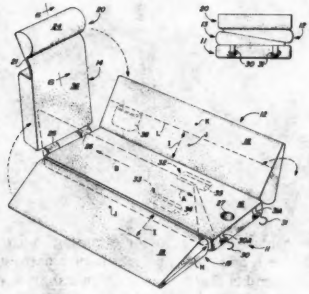
follower bellows for biasing either of said nozzles for selectively changing the desired optimum water-spray angle.

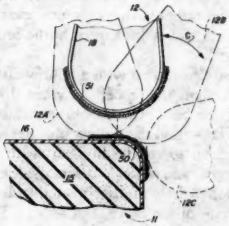
4,630,323

BATHTUB LINER

Dennis R. Sage, and Monica M. Sage, both of 1204 E. Bethany Home, Phoenix, Ariz. 85014

Filed Aug. 2, 1985, Ser. No. 761,689
Int. Cl.[4] A47K *3/02*
U.S. Cl. 4—580 **3 Claims**





1. In combination with a bathtub having a drain, an upper peripheral edge, a bottom surface and inner side surfaces, a portable resilient bathtub liner including

(a) a first resilient pad covering and contacting said bottom surface of said bathtub, said pad including an inner core of resilient material enclosed by a layer of water resistent material which detachably adheres to said bottom surface of said bathtub, said pad tapering from one of said ends to the other of said ends such that water in the bathtub flows under the force of gravity from one of said ends down said pad toward said bathtub drain when water is being emptied from said bathtub through said drain;

(b) an upright elongate second resilient pad of generally uniform symmetrical triangular cross section along the length thereof and positioned inside said upper peripheral edge of said bathtub and having

(i) an elongate bottom portion positioned adjacent said first pad and parallel to said bottom surface of said bathtub,

(ii) an elongate top portion generally parallel to said bottom portion,

(iii) a height equal to the shortest distance between said bottom portion and said top portion,

(iv) an outer generally continuous smooth planar surface spanning the distance between said top and bottom portions, facing one of said inner side surfaces of said bathtub, and formed of a material which detachably adheres to said one of said side surfaces, substantially the entire area of said outer surface contacting said one of said side surfaces of said bathtub,

(v) an inner generally smooth planar surface opposed to and spaced apart from said outer surface, spanning the distance between said top and bottom portions, and sloping upwardly from said bottom portion toward said one of said side surfaces of said bathtub and said outer planar surface of said second pad,

the center of gravity of said second pad being in said second pad at a distance from said bottom portion equal to less than one-half of said height of said second pad, the force of gravity's acting on said second pad stabilizing said second pad against said one of said side surfaces of said bathtub; and,

(c) elastic strap means having

(i) a first end attached to said first pad, and

(ii) a second end attached to said bottom portion of said second pad,

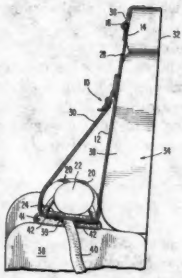
said elastic strap means pulling said bottom portion of said second pad downwardly toward said bottom surface of said bathtub.

4,630,324

TRAVELING RECLINING RESTRAINT AND COLLISION-PROTECTION DEVICE

Kenneth E. Fligsten, and Ann M. Fligsten, both of 507 West Dr., Severna Park, Md. 21146

Filed Nov. 18, 1985, Ser. No. 799,241
Int. Cl.[4] A47C *7/04*; A47D *31/00*
U.S. Cl. 5—94 **13 Claims**



1. A restraint device for restraining a passenger in a moving vehicle, comprising:

a flexible sheeting for cradling the passenger and having first and second end portions and a central portion;

means for securing at least the first end portion of said sheeting to a vehicle seat back;

securement means for securing the passenger in a prone position at the central portion of said sheeting; and

means for attaching the second end of said sheeting to said first end, forming thereby a U-shaped cradle, said central portion of said sheeting forming the curvate portion of said cradle.

4,630,325

METHOD OF AN APPARATUS FOR LASTING SIDES OF SHOES ON LASTS, COMPRISING A SIDE TACK INSERTION DEVICE

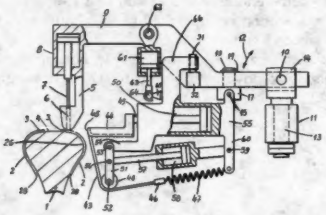
Rudolf Bender, Mucke-Ruppertenrod; Hans-Gerd Dietrich, Friedrichsdorf, and Gerhard Giebel, Bad Soden, all of Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

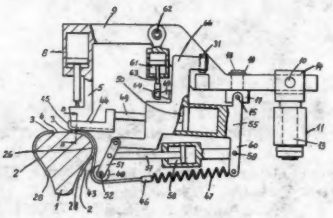
Continuation of Ser. No. 603,508, Apr. 24, 1984. This application Mar. 21, 1986, Ser. No. 842,759

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1983, 3314906

Int. Cl.[4] A43D *21/12, 23/02, 21/00*

U.S. Cl. 12—8.1 2 Claims





1. A combined wiper and tack insertion device for a lasted shoe comprising

a tack insertion device,

an arm for carrying said tack insertion device,

means for supporting said arm for horizontal movement along a selected path,

clamp means for forcefully engaging and tensioning an upper to prepare the upper for tack insertion including

a wiper assembly,

a tensioning assembly, and

housing means for supporting said wiper assembly and said tensioning assembly,

said arm including means for supporting said housing means for rotation about a horizontal axis,

means for forcefully biasing said housinig means from an elevated position towards a lowered position,

said wiper assembly including

wiper means displaceable with said housing means, and

means for horizontally, forcefully displacing said wiper means from a retracted position to an advanced position,

said tensioning assembly including a tension strap secured at one end to said wiper means and having an outer surface adapted to forcefully engage the lasted shoe,

means for non-compressively engaging the inner surface of said tension strap,

means for mounting said non-compressively engaging means on said housing means and

means for pulling the other end of said tension strap.

4,630,326

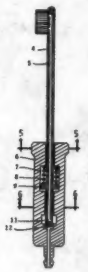
MICRO-STROKE MECHANICAL TOOTHBRUSH

Robert B. Stevens, P.O. Box 26284, Honolulu, Hi. 96825

Filed Jul. 15, 1985, Ser. No. 755,157

Int. Cl.[4] A46B *13/06*

U.S. Cl. 15—22 R 1 Claim



1. A mechanical toothbrush for cleansing and rinsing the sides of the teeth and sulcus by means of a narrow-row soft bristle-brush member that moves through a short-stroke in the direction of the longitudinal axis of the toothbrush stem such that the tips of the bristles of the bristle-brush member tend to remain where placed and produce only an agitation, and wherein, an intermittent stream of water pressure pulses powers the toothbrush and is discharged at the bristle-brush member, comprising;

a tubular toothbrush stem with a hollow channel within the toothbrush stem that receives water through induction ports near the base of the toothbrush stem wherein said water travels within the hollow channel to a bristle-brush member, distal to the toothbrush stem water induction ports, wherein said water is discharged, and wherein, the cross-sectional area of the bristle-brush member has a narrow width of not more than about 0.3 cm by a length of any dimension wherein the length in cross-section is generally parallel in direction to that of the longitudinal axis of the toothbrush stem, and wherein, proximal to the bristle-brush member, within the toothbrush housing, the toothbrush stem is widened to form a flange, and wherein, the toothbrush stem is round in cross-section near its base, where it acts as a piston, and wherein, the toothbrush stem has several flat sides within the toothbrush housing, proximal to the bristle-brush member, so as to prevent rotational motion of the toothbrush stem;

a generally cylindrical housing, that acts as a handle for the toothbrush stem, the longitudinal axis of the housing being in the same direction as that of the longitudinal axis of the toothbrush stem that the housing holds, in part, within it, wherein, within the housing there is a pressurizing conduit that increases the pressure of the intermittent water pressure pulses prior to their impacting upon the toothbrush stem base, and wherein, there is a depressurizing chamber that relieves the pressure of the water pressure pulses after the toothbrush stem has moved a pre-determined short-stroke length distance from the pressurizing conduit wherein the water is directed into the water induction ports of the toothbrush stem by pressure gradient, and wherein, the housing has a spring chamber that houses a spring that acts upon a flange on the toothbrush stem thereby encouraging the toothbrush stem to a position so that the toothbrush stem base is closest to the pressurizing conduit, and wherein, the housing closely holds the toothbrush stem within it.

4,630,327

SINGLE-ARM WINDSHIELD WIPER FOR MOTOR VEHICLES

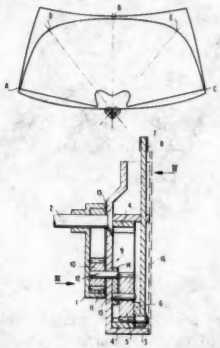
Manfred Schmidt, Sindelfingen; Hans Trube, Herrenberg, and Hermann Grimm, Ostelsheim, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 23, 1985, Ser. No. 758,054

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1984, 3427933

Int. Cl.[4] B60S *1/26*

U.S. Cl. 15—250.21 4 Claims



1. For motor vehicles, a windshield wiper having at least a single telescope arm, the arm being variable in its effective length during wiper movement,

a drive housing comprising means for guiding the wiper arm during changing of wiper arm effective length,

a first gear rim means provided with internal toothing, the first gear rim means being fixed to the drive housing,

a first pinion means meshing with the first gear rim means for retracting and extending a displaceable part of the wiper arm, wherein the first pinion means has half the pitch diameter of the first gear rim means and being rotatable on a first axis of a crank means,

a shaft of the crank means being rotatably guided on a second axis through an outer wall of the drive housing,

a second pinion means fixed to said shaft outside the outer wall,

a second gear rim means fixed to the vehicle, said second gear rim means meshing with said second pinion means, and

means for articulating the extendable part of the wiper arm to the first pinion means on the pitch diameter of the first gear rim means.

4,630,328

SELF-COMPENSATING SUPPORT ELEMENT AND END CLOSURE THEREFOR

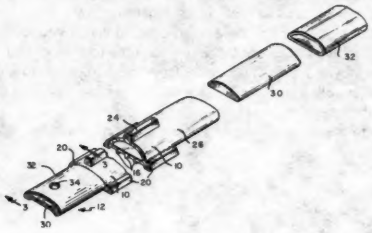
Donald W. Croteau, Oxford, Mass., assignor to Thermo Electron-Web Systems, Inc., Auburn, Mass.

Filed Nov. 27, 1985, Ser. No. 802,693

Int. Cl.[4] G03G *21/00*; D21G *3/00*

U.S. Cl. 15—257 R 13 Claims

1. A self-compensating support element for use in a doctor blade holder or the like, comprising: a hollow elongated flexible tube; an incompressible liquid filling said tube except for the end regions thereof; pliable inserts received in said end regions; and tubular metal sleeves surrounding said end regions, said tube being tightly clamped between said sleeves and



said inserts to seal against the escape of said liquid from said tube.

4,630,329

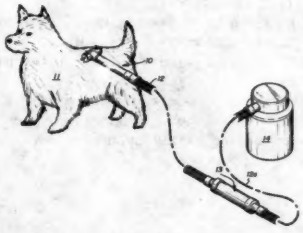
VACUUM ASSISTED FLEA COMBING DEVICE

Stephen Shores, 1112 N. Britain, Irving, Tex. 75061

Filed May 6, 1985, Ser. No. 730,501

Int. Cl.[4] A01M *1/06*

U.S. Cl. 15—368 4 Claims



1. A flea combing devise comprising: a vacuum system hollow head including a cylindrical transverse member having a transverse port; a flea comb affixed to said cylindrical transverse member with tines of said flea comb extended through said transverse port; a cylindrical exhaust port member of the hollow head means extending from the cylindrical transverse member at right angles thereto; a hollow cylindrical exhaust extension affixed to and extending coaxially from the exhaust port member; and a means for adjusting a vertical axis of the flea comb from a position at a right angle to a longitudinal axis of the exhaust port member to a multiplicity of acute angle positions to said longitudinal axis.

4,630,330

FASTENING CLIP ROTATABLE IN A HOUSING BORE

Manfred Keller; Rudi Kölle, both of Sindelfingen; Winfried Schreiber, Stuttgart, and Klaus Claar, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 19, 1985, Ser. No. 777,590

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434849

Int. Cl.[4] B23P *11/02*

U.S. Cl. 16—2 1 Claim

1. To be rotatably fastened in a housing bore and for receiving a linkage of circular cross-section having a linkage region and a beveled terminal region adjacent thereto,

a fastening clip comprising,

a flange circumferential to the clip located substantially in a central region of said clip,

a plurality of spreadable fastening elements extending from the flange in a first direction,

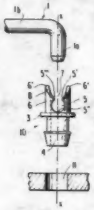
cylindrical walls extending from the flange in a second direction substantially opposite to said first direction,

each cylindrical wall having an outer surface,

a central passage orifice within the cylindrical walls,

the central passage orifice having an introductory channel in each cylindrical wall remote from the flange for directing the bevelled terminal region of the linkage into said central passage orifice,

each introductory channel having an interior surface,



a plurality of clip orifices in said cylindrical walls for holding the linkage region received from the introductory channel of the central passage orifice,

each clip orifice having a periphery,

each of the cylindrical walls being dimensioned so that each clip orifice is enclosed by the cylindrical walls for more than 180° about the periphery of said clip orifice,

and wherein

each of the interior surfaces of the introductory channels is beveled inwardly towards the flange from every point on the outer surface of the cylindrical wall contiguous thereto to a clip orifice.

4,630,331

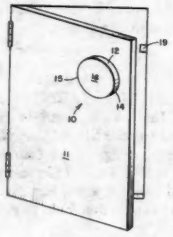
ONE PIECE CHILD SAFETY HANDLE

Kenneth D. Collister, 130 W. Beardsley, Elkhart, Ind. 46514

Filed Jun. 24, 1985, Ser. No. 747,775

Int. Cl.[4] E05B 1/02

U.S. Cl. 16—111 R **10 Claims**



1. One piece child safety handle comprising a substantially circular disc having two substantially parallel sides, each of said sides having a diameter of between about 4.25 inches and about 5 inches and wherein the thickness of said disc between said substantially parallel sides is between about 0.5 inch and about 0.625 inch.

4,630,332

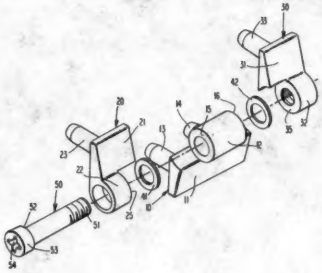
ADJUSTABLE FRICTION PLASTIC HINGE HAVING NON-SQUEAK PROPERTIES

Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.

Continuation of Ser. No. 669,611, Nov. 8, 1984, abandoned. This application Nov. 25, 1985, Ser. No. 800,911

Int. Cl.[4] E05D 11/08

U.S. Cl. 16—273 **7 Claims**



1. An adjustable friction hinge made of different plastic materials selected to have anti-squeak characteristics when in sliding frictional engagement, said hinge comprising:

(a) first means having a leaf portion and a first knuckle projecting therefrom having a bore coaxial with the pivot axis of the hinge;

(b) second means having a leaf portion and spaced-apart knuckles projecting therefrom having bores coaxial with the pivot axis, wherein said second means comprises two separate pieces having integral therewith one of the spaced-apart knuckles;

(c) one of said spaced-apart knuckles having a non-threaded cylindrical bore having an internal shoulder and the other knuckle having an internally-threaded bore;

(d) said first knuckle positioned between said spaced-apart knuckles;

(e) said first and second means formed of a first plastic material having elastic properties;

(f) a single annular washer positioned at each end of the first knuckle, separating the ends of the first knuckle from the ends of the spaced-apart knuckle, and in direct contact with one end of said first knuckle and one end of said spaced-apart knuckles;

(g) said annular washers being formed of a second plastic material selected to be different from said first plastic material such that the coefficients of static and dynamic friction of the first and second plastic materials when in frictional engagement with each other are similar, the difference between the coefficients of static and dynamic friction being substantially less than if the first and second plastic materials were indentical, thereby to provide said hinge with anti-squeak properties, and

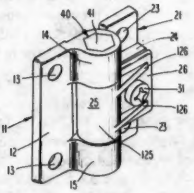
(h) an adjustment screw formed of said first elastic plastic material positioned in the bores of said knuckles, said screw having a cylindrical head at its one end for engagement with the internal shoulder of the non-threaded knuckle and having a threaded shank at its other end for threaded engagement with the internally-threaded bore of the other knuckle of the pair, said screw being adapted to elongate slightly when tightened thereby to apply an axial force on the threads of said other knuckle, thereby to maintain the frictional adjustment of said hinge during use.

4,630,333

ADJUSTABLE FRICTION HINGE

James H. Vickers, Middletown Township, Delaware County, Pa., assignor to Southco, Inc., Concordville, Pa.

Filed Dec. 16, 1985, Ser. No. 809,342
The portion of the term of this patent subsequent to Jan. 1, 2002, has been disclaimed.
Int. Cl.[4] E05D 11/08
U.S. Cl. 16—338 4 Claims



1. An adjustable friction hinge of thermoplastic material, said hinge comprising:

(a) a first hinge leaf having first and second knuckles at spaced separation, each of said first and second knuckles having a non-circular hole therethrough;

(b) a second hinge leaf having a clamping knuckle adapted to be received into the spaced separation between said first and second knuckles of said first hinge leaf, said clamping knuckle having inner and outer clamping extensions for adjusting the inside radius of said clamping knuckle, each of said clamping extensions having a bolt hole therethrough, said bolt holes being in registry with each other, said inner clamping extension having a non-circular recess therein;

(c) a hinge pin having non-circular end portions and a circular cross-section intermediate portion, said non-circular end portions having a maximum diameter larger than that of the circular intermediate portion and also larger than the inside diameter of said clamping knuckle, said non-circular end portions of said hinge pin being received within said spaced-apart non-circular through holes of said spaced-apart first and second knuckles of said first hinge leaf, said circular intermediate portion of said hinge pin being received within the adjustable inside diameter of said clamping knuckle, one of said non-circular end portions of said pin being receivable during assembly within the expanded inside diameter of said clamping knuckle;

(d) an adjustment screw having a shank adapted to pass through said bolt holes of said clamping extensions for adjusting the inside diameter of said clamping knuckle;

(e) a non-circular nut of corresponding size and shape provided in said non-circular recess of said inner clamping extension for receiving a threaded shank portion of said adjustment screw;

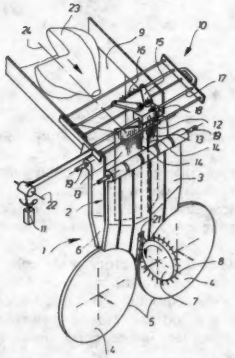
(f) said inner clamping extension having at the base of said non-circular recess an integral elevated ring encircling its bolt hole and contiguous to the periphery thereof, the material of said ring being adapted, during tightening of said adjustment screw, to be compressed by said nut and squeezed into the threads of said adjustment screw, thereby to impose sufficient drag on said screw to maintain the adjustment.

4,630,334

DEVICE FOR ALIGNING FISH

Reinhard Evers, Stockelsdorf, and Werner Wenzel, Lübeck, both of Fed. Rep. of Germany, assignors to Nordischer Maschinenbau Rud., Fed. Rep. of Germany

Filed Oct. 30, 1984, Ser. No. 666,504
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1983, 3339631
Int. Cl.[4] A22C 25/08
U.S. Cl. 17—56 5 Claims



1. A device for aligning the rumps of fish, particularly flat fish, and for feeding the same into a fish processing machine in aligned position, said device comprising:

a. feeding chute means for receiving said fish rumps in aligned head-tail orientation with respect to their longitudinal axes, and for pre-aligning said fish rumps in approximate alignment with the central longitudinal axis of said feeding chute means;

b. feeding shaft means disposed substantially vertically and communicating with the downstream end of said feeding chute means for receiving said pre-aligned fish rumps from the latter, said feeding shaft means having a central longitudinal axis aligned with the central longitudinal axis of said feeding chute means, and including depending guiding elements forming borders of said feeding shaft means, said guiding elements being movably mounted for synchronous and resilient displacement in pairs in response to engagement by said fish rumps;

c. conveyor means communicating with the interior of said feeding shaft means for conveying said fish rumps outwardly thereof;

d. guiding plate means including a pair of depending guiding plates terminating in longitudinal edges; and

e. mounting means pivotally mounting said guiding plates along said longitudinal edges with one longitudinal edge of one guiding plate extending parallel and proximate to one longitudinal edge of the other guiding plate and with said guiding plates being arranged in V-shaped formation opening towards said guiding chute means;

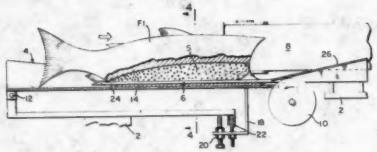
said guiding plates extending downwardly within said feeding shaft means with said guiding plates located symmetrically on either side of said central longitudinal axis of said feeding shaft means, said guiding plates being mounted to pivot resiliently about the axes of their proximate longitudinal edges under contact of the fish rumps passing through said feeding shaft means, thereby increasing the included angle of said V-shaped formation;

whereby said guiding plates center said fish rumps with their longitudinal axes aligned with the central longitudinal axis of said feeding shaft for delivery to said conveyor means.

4,630,335
FISH PROCESSOR

Brian J. Claudon, 1604-127th SE, Bellevue, Wash. 98005

Filed Jun. 24, 1983, Ser. No. 507,798
Int. Cl.[4] A22C *25/08, 25/14*
U.S. Cl. 17—58 4 Claims



1. A machine for slicing the belly skin of a fish without damage to the viscera, the slice terminating at the anus comprising:

an upwardly open tray for supporting and guiding a fish in a tail following, belly down condition,

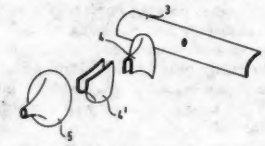
an elongated straight rod having a first end overlying and spaced from the tray and a second end contiguous with a downwardly open hood, said rod being of sufficient length to extend along the inside of the belly skin from the front of the fish and exit the anus,

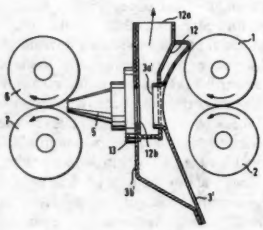
cutter means mounted within the hood such that a fish placed upon the rod and moved forwardly allows the belly to be sliced, terminating at the anus without damaging the viscera.

4,630,336
APPARATUS FOR GATHERING A FIBER WEB INTO A SLIVER IN A CARDING MACHINE

Theo Schöpwinkel, and Wilfried Weber, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Jul. 27, 1984, Ser. No. 635,259
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1983, 3327574
Int. Cl.[4] D01H *13/04*
U.S. Cl. 19—288 9 Claims



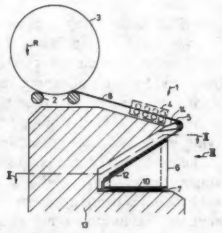


1. In an apparatus for gathering a running fiber web into a sliver, including a web guide element having edge portions defining an outlet opening through which said web passes; and a trumpet situated downstream of said outlet opening of said web guide element as viewed in a direction of web advance, said trumpet having an entrance opening and an outlet opening and being arranged for compressing said fiber web, the improvement comprising pre-compressing means situated upstream of said trumpet at a distance therefrom for pre-compressing said fiber web prior to its introduction into the entrance opening of said trumpet; said web guide element comprising said pre-compressing means; further comprising at least one trumpet-shaped guide member situated between said outlet opening of said guide element and said trumpet; each trumpet-shaped guide member comprising said pre-compressing means, whereby said pre-compressing means is multi-stage; and guiding means for guiding air, flowing against said direction of web advance and generated by web compression by said trumpet, away from a zone extending between said pre-compressing means and said outlet opening of said trumpet.

4,630,337
APPARATUS FOR DOUBLING A FIBER WEB

Giuseppe Verzilli, Wiesendangen, and Rene Schmid, Niederneunforn, both of Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Oct. 1, 1984, Ser. No. 656,673
Claims priority, application Switzerland, Oct. 10, 1983, 5507/83
Int. Cl.[4] D01H *5/00*
U.S. Cl. 19—296 19 Claims



1. An apparatus for doubling webs comprising:

web transport means for transporting a web in a first predetermined transport direction;

a web collecting element for collecting the web delivered by the web transport means and for guiding such for movement in a second predetermined transport direction;

a diverter plate arrangement disposed between said web transport means and said web collecting element for diverting the web from the first predetermined transport direction of the web transport means into the second predetermined transport direction of the web collecting element;

a web diverter arranged between the web transport means and the diverter plate arrangement; and

said diverter plate arrangement being located substantially directly below the web transport means.

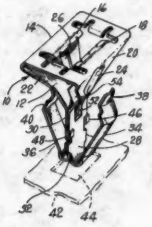
4,630,338
MOLDING CLIP

Robert W. Osterland, Marine City, and Nicholas M. Benedetti, Sterling Heights, both of Mich., assignors to USM Corporation, Farmington, Conn.

Filed Dec. 19, 1985, Ser. No. 810,793
Int. Cl.[4] A44B *21/00*
U.S. Cl. 24—293 7 Claims

1. A resilient molding clip for retaining a decorative item in a bridging position over a gap between two spaced members, wherein said clip is received by an aperture in a base disposed within said gap, comprising (1) an upper body position having

a planar top containing means adapted to engage and retain the underside of said decorative item; (2) a pair of downwardly and inwardly sloping sides connected to said top which, together with said top, give said upper body portion a triangular cross section; (3) a lower body portion formed by a continuation of said sides in substantially parallel relationship to one another and substantially perpendicular to said top, said lower body portion extending downwardly part the point at which said sides meet in abutting relationship; and (4) a pair of upwardly turning and outwardly facing flexing wings or legs connected to said lower body portion, said wings or legs being adapted to their upper ends to prevent said ends from passing completely through said aperture in said base, said sides each having a cut-out extending into said upper body portion and said lower body portion to permit entry of said upper ends of said flexing wings or legs, thus permitting said wings or legs to be compressed during assembly and disassembly of said clip and said base.

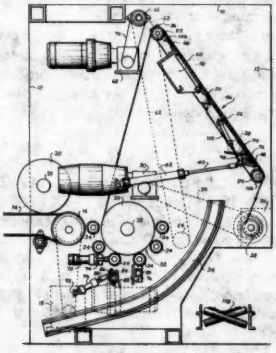


4,630,339

METHOD AND APPARATUS FOR INSPECTING A LENGTH OF MATERIAL

Nicholas L. Morizzo, Cornwall, N.Y., assignor to Krantz America, Inc., Charlotte, N.C.

Filed May 4, 1984, Ser. No. 606,917
Int. Cl.[4] D06H *3/04*
U.S. Cl. 26—70 **19 Claims**



1. Apparatus for permitting inspection of a length of sheetlike material such as textile fabrics and the like, said apparatus including:

a. mounting means for mounting a pair of spindles in spaced relation to one another with said material being initially wound onto one of said spindles to provide a reach of said material extending in a generally horizontal plane between said spindles, and selectively operable drive means for operating said spindles to cause said material to be unwound from said one of said spindles and onto the other of said spindles;

b. supporting means having a generally flat surface portion across which said material is moved to permit inspection thereof;

c. means for mounting said supporting means at a first position disposed on one side of said plane of said reach of material; and

d. operating means for selectively moving said supporting means and its flat surface portion from said first position in a direction upwardly and through said generally horizontal plane of said reach of material to a second position at the other side of said plane, said operating means including means for disposing said flat surface portion of said supporting means at an acute angle with respect to vertical when said supporting means is at said second position thereof.

16. A method of manipulating a length of sheetlike material such as textile fabrics to permit visual inspection thereof, said method comprising the steps of:

a. providing a reach of said material extending between a pair of spaced spindles in a generally horizontal plane;

b. locating a material supporting member having an extending surface portion at an initial position beneath said reach of material;

c. moving said supporting member in a direction of movement extending upwardly through said plane of said reach of material to cause said material to be engaged by said supporting member and then positioning said supporting member so that said material is supported along said extending surface portion thereof;

d. driving one of said pair of spindles to cause said material to be wound onto said one spindle and unwound from the other spindle while said material is supported along said surface portion; and

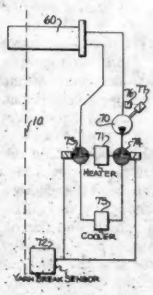
e. returning said supporting member to said initial position after all of said material has been wound onto said one spindle.

4,630,340

APPARATUS FOR DRAWING A WARP SHEET OF YARNS

Karl Bauer; Michael Hanisch, and Erich Lenk, all of Remscheid, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 676,722
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343499; Feb. 25, 1984, 3406937
Int. Cl.[4] D02H *13/08*; D02J *1/08, 1/22*
U.S. Cl. 28—187 **3 Claims**



1. An apparatus for processing a warp sheet of yarns comprising

means for advancing the warp sheet along a path of travel while drawing the warp sheet,

heating means positioned along the path of travel for applying heat to the advancing warp sheet, and including at least one roll extending transversely across the warp sheet, with said roll having fluid conduit means extending through the interior thereof, a source of heated fluid, and pump means for circulating the heated fluid from said source through said fluid conduit means,

control means for selectively terminating the advance of the warp sheet upon a yarn break or the like, and including means for interrupting the circulation of the heated fluid through said fluid conduit means to thereby interrupt the application of heat from said roll to the warp sheet upon the termination of the advance.

4,630,341

APPARATUS FOR THE INTRODUCTION OF A PIECE INTO A SEAT IN AN OBJECT

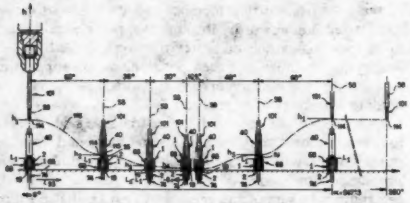
Daniel Rohmer, Herrlisheim, and Alain Scherrer, Pfastatt, both of France, assignors to Manufacture de Machines du Haut-Rhin, Mulhouse, France

Filed Dec. 21, 1983, Ser. No. 564,093

Claims priority, application France, Dec. 22, 1982, 82 21557

Int. Cl.⁴ B21D *51/54*; F42B *7/02*

U.S. Cl. 29—1.3 **10 Claims**



1. In a method of introducing a workpiece into a seat of an object by means of a multi-part vehicle adapted to receive a workpiece therewithin to facilitate the manipulation thereof, comprising at least one tubular lining having a peripheral interior face defining a workpiece receiving space therewithin and a peripheral external face of constant transverse section, and a body in which the lining is mounted for reciprocation along the common axis of the lining and body whereby the lining can be moved from an initial position with respect to the body during the manipulation operation, and can be restored to its initial position with respect to the body following such manipulation, the body presenting an internal peripheral face of constant transverse section which is complementary to the exterior peripheral face of the lining, the lining and body being of equal length so that in one relative position thereof the respective end faces of the body and the lining are coplanar, the seat presenting a predetermined axis and the object presenting, in its zone near the seat an external envelope formed of generatrices parallel to said predetermined axis of the seat, the improvement comprising introducing and retaining the workpiece in the space within the vehicle, coupling the vehicle and the object into a relative position in which the respective axes of the seat and of the space within the lining of the vehicle coincide and in which the seat faces the space, transferring the workpiece from the space to the seat by a relative translation of the workpiece and the space along the common axis thereof, and to separate the vehicle and the object, the body of the vehicle presenting a peripheral interior face of which the section transverse to the axis thereof is complementary to said envelope of the object and, after having introduced the workpiece into the space within the lining of the vehicle, the vehicle and the object are coupled in said relative position by the lining of the vehicle in its said initial position, effecting the transfer of a part while causing a translation of the body with respect to the lining with the lining coupled to the object, to envelope the same by means of the body while allowing it also to engage upon the lining (operation a) and then pushing the workpiece until it goes into the seat (operation b), and thereafter causing the return of the vehicle to the initial position thereof before separating the object therefrom.

4,630,342

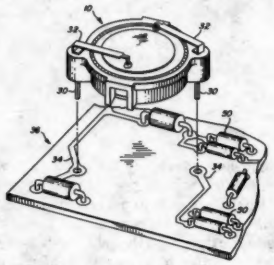
METHOD OF MOUNTING A PIEZOELECTRIC HELMHOLTZ TRANSDUCER ON A PRINTED CIRCUIT BOARD

Thomas H. Tichy, Albuquerque, N. Mex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 684,879, Dec. 21, 1984, abandoned. This application Mar. 10, 1986, Ser. No. 838,441

Int. Cl.⁴ H01L *41/22*

U.S. Cl. 29—25.35 **2 Claims**



1. A method for manufacturing an assembly containing a printed circuit board (PCB) and a piezoelectric transducer comprising the steps of:

(a) mounting the piezoelectric transducer on the PCB, the transducer comprising a piezoelectric driver means for converting applied electric signals into mechanical vibrations which create sound, and Helmholtz resonator means coupled to said driver means for receiving the sound, said resonator means having a resonant chamber defined by bottom, top, and side walls, and at least two ports that provide access to said chamber, at least one of the ports disposed contiguous to both said bottom and side walls;

(b) wave soldering said PCB with said piezoelectric transducer mounted thereto;

(c) applying a cleaning liquid to the soldered assembly; and

(d) causing any cleaning liquid disposed in said resonant chamber to flow out of said resonant chamber unimpeded by the presence of a vacuum since at least two ports in the chamber are provided.

4,630,343

PRODUCT FOR MAKING ISOLATED SEMICONDUCTOR STRUCTURE

John M. Pierce, Palo Alto, and William I. Lehrer, Los Altos, both of Calif., assignors to Fairchild Camera & Instrument Corp., Cupertino, Calif.

Continuation of Ser. No. 362,347, Mar. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 243,987, Mar. 16, 1981, abandoned. This application Sep. 6, 1985, Ser. No. 773,842

Int. Cl.⁴ H01L *21/461*

U.S. Cl. 29—576 W **10 Claims**

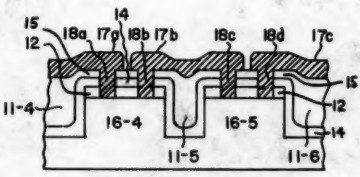
10. The method of forming an isolated semiconductor structure comprising:

forming active devices or selected components in to-be-formed islands of semiconductor material, each island being separated from adjacent islands by a band of semiconductor material in which are formed no active devices, said active devices being formed by placing selected dopants in said to-be-formed islands to form selectively doped regions in said islands;

etching grooves in the surface of the semiconductor material so as to remove a portion of each band in which no active devices were formed, thereby to create a plurality of islands of semiconductor material, each island containing active devices;

oxidizing the semiconductor material exposed by said grooves to form an oxide layer of selected thickness over the surface of said grooves;

forming and smoothing a glass film on the resulting structure by



(a) reacting a gaseous mixture of germane and silane with oxygen at a reaction temperature of from 350°–500° C. to form a mixed germanium oxide/silicon oxide glass vapor;

(b) depositing said glass mixture vapor on said resulting structure as a film, said germanium oxide being about 50 mole percent of the germanium oxide/silicon oxide glass mixture; and

(c) reflowing the resulting glass film at a temperature range of approximately 650° C. to 1000° C. to smooth the surface topography of the film to an essentially flat surface.

4,630,344

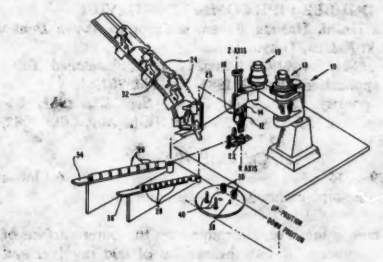
APPARATUS AND METHOD FOR ASSEMBLING PARTS

William B. Boyle, Cary, N.C.; Rodolfo Candelaria, Jr., Austin, Tex., and Edward P. Hecker, Coral Springs, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 18, 1985, Ser. No. 756,197

Int. Cl.[4] B21D *53/10*; B23P *19/02*; B25J *15/00*

U.S. Cl. 29—149.5 R **10 Claims**



1. Apparatus for assembling different size parts in a vertical assembly using a manipulator having a gripper attached thereto, said parts to be assembled each having an opening therein of a diameter slightly larger than a diameter of a section of fingers on said gripper, said apparatus comprising;

a pair of said fingers attached to and extending from said gripper in parallel relationship and movable toward and away from one another under the control of said gripper;

different diameter curved outer sections extending around the periphery of and stepped along the length of said fingers, the smallest diameter curved section located at the outer end of the fingers and successively wider diameter sections located along the fingers as the inner end is approached;

one of said predetermind diameter sections having a predetermined slope;

the diameters of said curved outer sections being small enough when said fingers are in closed position to fit into said opening and to contact the inner surface diameter of the opening in said part to be assembled when the fingers are slightly moved away from one another by said gripper;

said section and its diameter being further selected in accordance with its position along the length of said fingers.

10. A method for automatically assembling different size parts using a manipulator having a gripper with multi-shaped fingers extending therefrom and an assembly fixture located within the work space of said manipulator having a pneumatic cylinder for raising and lowering a base sleeve along a guide post comprising the steps of: 1, picking up a retainer ring from a stack of retainer rings by means of said pair of fingers; 2, raising said base sleeve on said guide post by means of said pneumatic cylinder; 3, placing said retainer ring on said base sleeve; 4, lowering said base sleeve on said guide post by means of said pneumatic cylinder; 5, inserting the pair of fingers into a first bearing a selected distance and opening said fingers so that the outer curved surfaces of said selected sections contact the inner diameter of the opening in the first bearing and placing the bearing on the guide post; 6, inserting the fingers into the opening in the casting and grasping the casting by opening the fingers and placing the casting in the assembly fixture over the bearing on the post and locking the first retainer ring in position; 7, grasping the inner diameter surface of the spacer and placing it in the casting; 8, grasping the inner diameter of the second bearing and placing it into the casting; 9, picking a second retainer ring from a second stack of retainer rings and inserting it into the casting. 10, firing the air cylinder on the assembly fixture to raise the base sleeve thereby pushing the casting onto the fingers of the manipulator which fingers grasp the inside diameter of the assembly fixture while moving to the up position; 11, moving the base sleeve down via the down operation of the pneumatic cylinder so that the casting can be moved and deposited by said manipulator.

4,630,345

METHOD FOR MANUFACTURING A CYLINDER UNIT FOR A CYLINDER PISTON COMBUSTION ENGINE

Dieter Lutz, Schweinfurt, Fed. Rep. of Germany, assignor to SACHS-Systemtechnik GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 21, 1984, Ser. No. 591,693

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310673

Int. Cl.[4] B23P *15/00, 19/02*; F02F *7/00*; B29B *13/00*

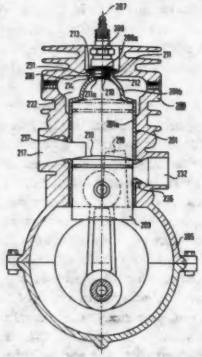
U.S. Cl. 29—156.4 WL **45 Claims**

1. A method of manufacturing an axially extending cylinder unit having a pair of opposite ends spaced apart in the axial direction thereof for a cylinder piston combustion engine, said cylinder unit comprising an internal cylindrical guiding face for a piston extending in the axial direction of the cylinder unit and at least one internal combustion space limiting face at one end of the cylinder unit and extending, at least partially, transversely of the axial direction of the cylinder unit and forming a combustion space, said method comprising the steps of

(a) forming the cylinder unit as a lining unit (1) having a longitudinal axis corresponding to the axis of the cylinder unit by one of the forming operations selected from the group consisting of cold impact forming, hot impact forming, deep drawing, press molding and injection molding, said lining unit being a monolithic unit including a cylindrical liner sleeve (*1a*) produced in the forming step and forming said internal cylindrical guiding face and further forming said internal combustion space limiting face, said cylindrical internal guiding face and said internal combus-

tion space limiting face produced in the forming step being ready for operation without further machining,

and said method further comprising the step of



(b) incorporating said lining unit (1) into a cylinder housing (8).

4,630,346

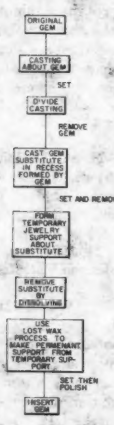
ARTICLE FORMING METHOD

Steven M. Singer, 408 Northlake Ct., Apt. 306, North Palm Beach, Fla. 33408

Filed Mar. 20, 1985, Ser. No. 714,114

Int. Cl.[4] B23P *5/00*

U.S. Cl. 29—160.6 4 Claims



4. A method of making jewelry having a setting to retain a gem therein, comprising, in combination, the steps of:

forming a replica of the gem, said replica having an external configuration being substantially identical to the external configuration of the gem;

crafting a temporary wax gem retainer having an artistic design thereon about the replica, said retainer adhering substantially to the external configuration of the replica so that said replica cannot be physically removed from the temporary retainer without substantially destroying the artistic design thereon or without destroying the replica;

destroying the replica in situ without affecting the artistic design of the setting of the temporary retainer;

forming a permanent setting of cast metal having the artistic design thereon from the temporary setting by a lost wax process;

installing the gem in the cast metal fitting with a minimum of adjustments thereto, whereby the gem is securely held.

4,630,347

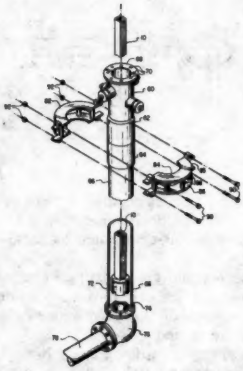
HYDRANT VALVE TOOL

James E. Chilton, 9409 Shady Valley, Dallas, Tex. 75238

Filed Jul. 22, 1985, Ser. No. 757,654

Int. Cl.[4] B25B *17/00*

U.S. Cl. 29—213 R 15 Claims



1. A hydrant tool assembly for removing or installing a seat ring and a valve from a hydrant shoe located beneath a hydrant, said tool assembly comprising:

valve cap means including a rectangular extension bar for mating with said seat ring and extending through a top portion of the hydrant;

hydraulic means attachable to the top portion of the hydrant for providing a torque force to the valve cap means; and

lever means attachable to the hydraulic means for enabling leveraged manual turning of the valve cap means.

4,630,348

DOUBLE-PIPE COMBINING DEVICE

Katsumasa Hoshi, Hasuda, Japan, assignor to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 419,624, Sep. 17, 1982, abandoned. This application Aug. 20, 1985, Ser. No. 767,633

Claims priority, application Japan, Sep. 22, 1981, 56-139820[U]; Sep. 22, 1981, 56-139819[U]; Aug. 30, 1982, 57-149223

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—234 6 Claims

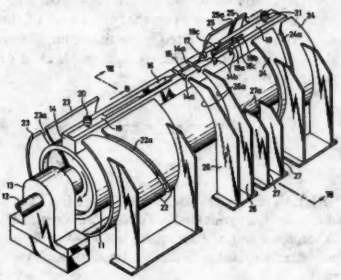
1. A double-pipe combining device comprising a revolver,

a pipe combining means arranged on the outer surface of said revolver in the axial direction of said revolver and comprising a first pipe receiving means, and a second pipe receiving means respectively formed in the state that they are longitudinally aligned with each other, and a pipe pusher slidably arranged in said pipe combining means in the state that said pipe pusher is longitudinally aligned with said first and second pipe receiving means, and

a cam mechanism for moving said pipe pusher forward and backward when said revolver is rotated to complete one rotation,

said double-pipe combining device being arranged to combine a smaller-diameter pipe and a larger-diameter pipe by rotating said revolver after placing said smaller-diameter pipe and said larger-diameter pipe respectively in said first

and second pipe receiving means, said cam mechanism serving to move said pipe pusher forward so that said pipe



pusher pushes one of said two pipes in order to combine said two pipes and further serving to move said pipe pusher backward to the original position thereof.

4,630,349

METHOD FOR ASSEMBLING TWO-WAY TRANSMISSION GEARS WITH POWER DISTRIBUTION

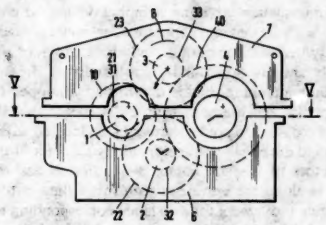
Josef Hellerhoff, Lowick; Peter Bunse, Rees, both of Fed. Rep. of Germany, and Hans te Beest, Diaxperlo, Netherlands, assignors to A. Friedr. Flender GmbH & Co. KG, Bocholt, Fed. Rep. of Germany

Filed Apr. 29, 1985, Ser. No. 728,570

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418543

Int. Cl.[4] B23P *11/00*; F16H *5/52*

U.S. Cl. 29—434 6 Claims



1. A method of assembling power-distributing two-way transmission gear means within a gear case comprising a lower portion and an upper portion forming a partition joint, said gear means comprising an axially freely adjustable shaft having fixed thereto for rotation therewith pinions with oppositely extending helical teeth, said gear means also comprising a driving gear disposed between said pinions for effecting power distribution through said axially freely adjustable shaft, said gear means also comprising two power branches with each power branch including an intermediate shaft, a driven shaft carrying thereon a driven gear and having an axis disposed with the axis of said axially freely adjustable shaft in the plane of said partition joint of said gear case, said intermediate shafts being mounted for rotation and being individually installed in said lower portion and in said upper portion, a gear and a pinion with rigid interconnection to the lower intermediate shaft, and a pinion and a gear connected to the upper intermediate shaft;

the method comprising:

placing said driven shaft into half bores of said lower portion;

placing said axially freely adjustable shaft having said pinions fixed thereto into corresponding half bores of said lower portion in a position displaced by a predetermined value in a suitable direction relative to the operational position of said axially freely adjustable shaft, whereby one of said pinions fixed to said axially freely adjustable shaft and said gear connected to said lower intermediate shaft come to mesh with each other;

pivoting said upper portion inwardly such that initially said pinion connected to said upper intermediate shaft comes into full mesh with said driven gear;

further lowering said upper portion so that said gear connected to said upper intermediate shaft comes into mesh with another of said pinions fixed to said axially freely adjustable shaft as placed into position, with said other pinion fixed to said axially freely adjustable shaft as placed into position with axial displacement; and

further lowering said upper portion to reach its final position so that said other pinion of said axially freely adjustable shaft and said gear connected to said upper intermediate shaft come to full mesh with each other under rotation and axial displacement of said axially freely adjustable shaft to reach its operational position.

4,630,350

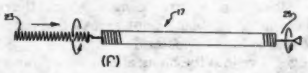
METHOD FOR MAKING A FLEXIBLE CORRUGATED RUBBER TUBING WITH INTERNAL REINFORCEMENT

Vance M. Kramer, Sr., 2341 Townly Rd., Toledo, Ohio 43614, and Vance M. Kramer, Jr., 853 Oak Knoll, Perrysburg, Ohio 43554

Continuation-in-part of Ser. No. 665,350, Oct. 26, 1984, abandoned. This application Jan. 27, 1986, Ser. No. 822,538

Int. Cl.[4] B23P *11/02*; B29C *65/64*

U.S. Cl. 29—453 1 Claim



1. A method for making flexible, corrugated rubber tubing with helical corrugations combined with an internal helical reinforcing component, comprising the steps of:

positioning an extruded sleeve of unreinforced, uncured rubber on a forming mandrel;

placing an external, collapsible helical form around said sleeve to define helical convolutions;

expanding said sleeve radially to form radial bulges between said convolutions;

axially foreshortening said sleeve and said helical form to form embryonic corrugations in said sleeve;

heat-treating said rubber sleeve to set said corrugations to form a flexible length of unreinforced, corrugated rubber tubing with a helical internal groove having a root diameter approximately equal to the inner diameter of said helical form;

forming a helix of relatively stiff, resilient wire rod having about the same helix outer diameter as the root diameter of said internal helical groove;

placing said wire rod helix adjacent to and in axial alignment with said length of corrugated rubber tubing while holding the end of said helix opposite said rubber tubing;

extending an elongated pulling tool axially through said length of corrugated rubber tubing from the end opposite said wire rod helix;

gripping with said pulling tool the end of said wire rod helix adjacent said corrugated rubber tubing;

pulling said wire rod helix with said pulling tool toward said corrugated rubber tubing while simultaneously rotating said pulling tool to reduce the diameter of said wire rod helix, thus maintaining a relatively constant pitch;

moving said stretched wire rod helix axially through said tube and simultaneously rotating it in a direction to thread said helix into said length; and

thereafter releasing said pulling tool from said helix whereby

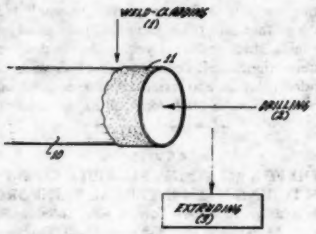
said helix expands radially into tight conformance with said groove.

4,630,351

MAKING CLAD SEAMLESS PIPES

Eckhard Kranz, Meerbusch, and Karl Düren, Duisburg, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 2, 1981, Ser. No. 317,132
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1980, 3044589
Int. Cl.[4] B23P 17/00
U.S. Cl. 29—527.2 5 Claims



1. Method of cladding steel tubes or pipes on the outside, comprising the steps of

providing a steel blank;

weld depositing a high-alloyed cladding material with a ferrite content not exceeding 50% onto the blank, an outer diameter of the blank being at least five times the thickness of the welded-on material;

drillig a bore into the blank at a diameter range of $\frac{1}{4}$th to $\frac{1}{3}$rd the blank diameter to obtain a tubular body; and

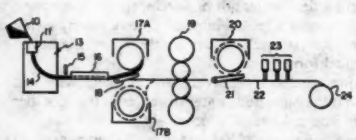
extruding the resultiing tubular body toward obtaining desired dimensions.

4,630,352

CONTINUOUS ROLLING METHOD AND APPARATUS

Vladimir B. Ginzburg, and George W. Tippins, both of Pittsburgh, Pa., assignors to Tippins Machinery Company, Inc., Pittsburgh, Pa.

Filed Sep. 4, 1984, Ser. No. 646,956
Int. Cl.[4] B21B 1/46, 41/00; B22D 11/12
U.S. Cl. 29—527.7 4 Claims



1. A method of casting metal slabs and rolling said metal slabs into strip and/or sheet in line comprising the sequential steps of:

(a) continuously casting a continuous steel slab having a thickness capable of being coiled;

(b) equalizing the temperature of the forward section of said continuous slab to provide a substantially homogeneous temperature therein;

(c) cutting off the forward section from said continuous slab to form an individual slab having the desired length;

(d) coiling alternative individual slabs in a first coiler furnace and in a second coiler furnace vertically disposed relative to said first coiler furnace and located downstream of a continuous caster and upstream of a rolling mill; and

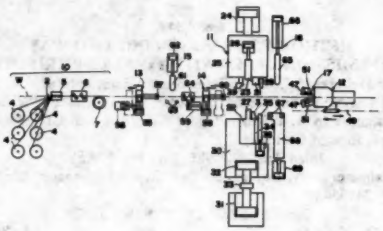
(e) rolling each individual slab to strip by paying off said individual slab through said rolling mill from one of said vertically disposed coiler furnaces while taking up the following individual slab on the other of said vertically disposed coiler furnaces so that the speed of the continuous casting is coordinated with the rolling speed to provide a substantially uninterrupted method of continuous casting and rolling.

4,630,353

INSULATION COVERING STRIPPING DEVICE

Takashi Okazaki, Toyonakashi; Yukio Matsu'ura, Takatsukishi, and Yoshihiko Saijo, Ibaragishi, all of Japan, assignors to Nippon Acchakutanshi Seizo Kabushiki Kaisha, Osakashi, Japan

Filed Sep. 13, 1985, Ser. No. 775,773
Claims priority, application Japan, Sep. 13, 1984, 59-192268
Int. Cl.[4] B23P 23/00; H01R 43/05, 43/01
U.S. Cl. 29—564.4 3 Claims



1. An insulation covering stripping device for use in combination with automatic apparatus for making electrical harnesses, wherein the apparatus includes a wire feed path extending substantially horizontally and axially of the apparatus; a connector attaching device comprising a cooperating assembling punch and die pair disposed on respective sides of the wire feed path, and a wire cutting blade located adjacent to the punch and die pair; a connector supplying device for supplying connectors to the assembling die; a first chuck reciprocally movable along the wire feed path for pulling out wires in an advancing movement for a distance corresponding to a desired length of the electrical harness; a second chuck for holding the supplied wires laterally at equal intervals, and guiding the same to the connector attaching device along the wire feed path, the second chuck reciprocally movable in a small range during which movement to align top ends of the wires, characterized in that the insulation covering stripping device comprises:

a third moving chuck for adjusting lengths of insulation covering to be stripped, the third moving chuck being located between the connector attaching device and the second moving chuck;

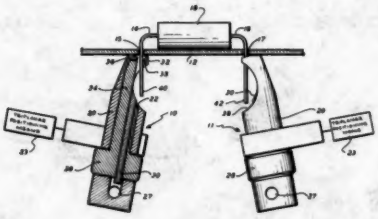
a stripping length varying device for varying the lengths of insulation covering to be stripped, the device being located between the second and third moving chucks, and including a plurality of varying plates which correspond to individual wires so that when the varying plates are moved down to push the wires individually, the wires are slackened downward, thereby causing the top ends of the wires to withdraw in accordance with a slackened portion; and

a stripping blade for slitting the insulation covering so that the insulation covering is removed from the slit when the wires are pulled backward, wherein end portions of the wires are differentiated in length by the stripping length varying device.

4,630,354
ELECTRICAL COMPONENT LEAD BENDING AND CUTTING APPARATUS

Theodore Staviski, 293 High Crest Dr., West Milford, N.J. 07480

Filed Apr. 22, 1985, Ser. No. 725,425
Int. Cl.[4] B23P 23/00, 19/04; H05K 3/32
U.S. Cl. 29—566.4 19 Claims



1. A lead bending and cutting apparatus comprising:

a rotatable element having an axis of rotation, a cutting face, and a longitudinal offset bore extending from said cutting face;

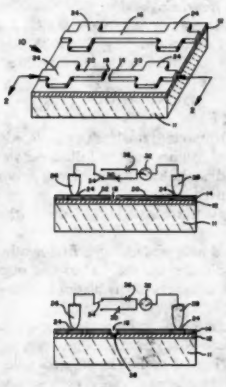
a housing having an internal cavity which cooperatively receives and substantially encloses said rotatable element, said rotatable element mounted within said housing for rotatation about said axis of rotation, said housing having an entrance opening which communicates with said bore at said cutting face when said rotatable element is positioned such that said bore and said opening are approximately adjacent to each other; and

drive means for rotating said rotatable element with respect to said housing.

4,630,355
ELECTRIC CIRCUITS HAVING REPAIRABLE CIRCUIT LINES AND METHOD OF MAKING THE SAME

Robert R. Johnson, Franklin, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Mar. 8, 1985, Ser. No. 709,876
Int. Cl.[4] H01L 21/66, 21/42
U.S. Cl. 29—575 20 Claims



1. A method of making a circuit assembly comprising:

providing a supporting substrate;

forming a plurality of conductive lines supported on said substrate to interconnect circuit elements supported or to be supported on said substrate;

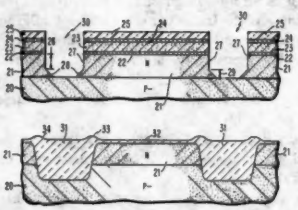
forming a deposited phase-change material capable of being changed from an intially relatively disordered, relatively high resistance state to a more ordered, more crystalline relatively low resistance state by the application of sufficient energy, said deposited phase-change material being located in electrical contact with at least portions of said conductive lines to form electrically parallel paths between selected portions of said conductive lines;

detecting at least one open circuit portion in one of said conductive lines within at least one of said selected portions; and applying sufficient energy to said phase-change material within said at least one selected portions of said conductive line having said detected open circuit portion to cause the inducement of a phase change within said phase-change material from said initially high resistance state to said low resistance state to form an electrically shunting conductive path around said detected open circuit portion of said one conductive line.

4,630,356
METHOD OF FORMING RECESSED OXIDE ISOLATION WITH REDUCED STEEPNESS OF THE BIRDS' NECK

Rosemary Christie, Hopewell Junction; Bao-Tai Hwang; San-Mei Ku, both of Poughkeepsie, all of N.Y., and Janet M. Sickler, Georgetown, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 19, 1985, Ser. No. 777,800
Int. Cl.[4] H01L 21/467, 21/76, 21/94
U.S. Cl. 29—576 W 18 Claims



1. Method of forming a recessed oxide isolation with reduced steepness of the bird's neck in a silicon substrate comprising:

providing a semiconductor silicon substrate;

forming on said substrate surface a mask stack of first silicon dioxide layer, polycrystalline silicon layer, second silicon dioxide layer and silicon nitride layer in that order;

patterning said mask stack to form openings at the areas where it is desired to form an oxide isolation pattern within said semiconductor substrate;

anisotropically reactive ion etching the silicon substrate exposed by the openings in said stack to a first portion of the desired depth obtaining therein trenches having substantially vertical walls;

chemically etching said silicon substrate to extend the trenches to a second portion of the desired depth and obtain inwardly sloped walls in the second portion; and

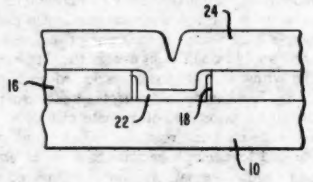
thermally oxidizing the exposed silicon in said trenches to form said isolation with reduced steepness of the bird's neck.

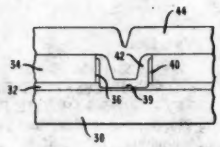
4,630,357

METHOD FOR FORMING IMPROVED CONTACTS BETWEEN INTERCONNECT LAYERS OF AN INTEGRATED CIRCUIT

Steven H. Rogers, Midwest City, Okla., and Thomas J. Hwang, Fremont, Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 2, 1985, Ser. No. 761,945
Int. Cl.[4] H01L 21/285, 21/88
U.S. Cl. 29—590 11 Claims





1. A method of forming improved contacts with a metallic lower layer of an integrated circuit comprising:
depositing a dielectric layer over said metallic lower layer;
forming an opening through said dielectric layer;
conformally depositing a layer of a first material of silicon over said dielectric layer;
removing said first material from horizontal surfaces of said dielectric layer;
selectively forming a refractory metal layer on the non-horizontal walls of the opening by reaction with retained first material; and
forming a metallic second layer over said dielectric layer and said refractory metal layer in said opening.

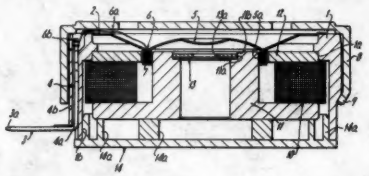
8. A method of forming improved contacts with a refractory metal lower layer of an integrated circuit comprising:
depositing a buffer layer of silicon material over said refractory metal lower layer;
depositing a dielectric layer over said buffer layer;
forming an opening through said dielectric layer having vertical side walls and a horizontal bottom formed of a portion of said buffer layer;
conformally depositing a layer of a first material of silicon over said dielectric layer, including said vertical side walls, and said horizontal bottom;
removing said first material of silicon from exposed horizontal surfaces of said dielectric layer and from said horizontal bottom, leaving at least a portion of said buffer layer over the bottom of said opening;
selectively forming a refractory metal first layer in said opening by reaction with retained first material on said vertical side walls and said buffer layer portion covering the bottom of said opening; and
forming a metallic second layer over said dielectric layer and said refractory metal first layer in said opening.

4,630,358

METHOD OF MAKING AN ELECTROSTATIC TRANSDUCER OF THE MOVING COIL TYPE

Frank Taylor, Bromley, and Trevor Burton, Maidstone, both of England, assignors to Standard Telephones and Cables Public Limited Company, London, England

Filed Aug. 16, 1984, Ser. No. 641,563
Claims priority, application United Kingdom, Aug. 16, 1983, 8322052
Int. Cl.[4] H04R 31/00
U.S. Cl. 29—594 8 Claims



1. A method of making an electroacoustic transducer capsule of the moving coil type comprising:
providing a first buffer store with a plurality of first sub-assemblies each comprising a moulded plastics carrier ring with a diaphragm secured thereto and a speech coil secured to the diaphragm concentric with a circular locating reference datum in the ring;
providing a second buffer store with a plurality of magnet assemblies each having a circular locating rim and an annular air gap in which the speech coil will be positioned;
providing a third store with a plurality of closure members for closing the rear of the transducer, and feeding the first sub-assemblies, the magnet assemblies and the closure members automatically to an assembly machine which first locates the rim of the magnet assembly against the reference datum with the speech coil positioned in the air gap and then secures the closure member onto the rear of the carrier ring to close the capsule and hold the magnet assembly against the reference datum.

4,630,359

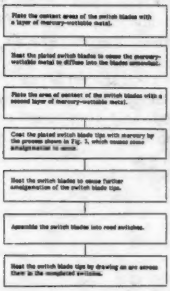
METHOD OF MAKING MERCURY CONTAINING REED SWITCHES

John Hill, Cincinnati, Ohio; Henryk Turczanski, and Cyril E. Coote, both of Kent, England, assignors to Standex electronics (UK) Limited, Kent, England

Continuation-in-part of Ser. No. 400,001, Jul. 20, 1982, abandoned. This application May 24, 1985, Ser. No. 738,064
Claims priority, application United Kingdom, Jul. 24, 1981, 8122946
Int. Cl.[4] H01H 11/02
U.S. Cl. 29—602 R 11 Claims

1. A method of making amalgamated plated contact blades for reed switches, comprising the following steps:
providing reed switch contact blades having tips which serve as contact areas;
plating the contact areas of said blades with a first layer of gold;
heating the gold plated blades in a first heating step to cause the gold to diffuse into the underlying material;
plating the contact areas of the blades with a second layer of gold;
providing a container having a mercury-wettable inside bottom surface coated with a thin layer of mercury, said container being of sufficient size to hold a plurality of switch contact blades loosely and approximately vertically;
placing said blades, tips down, in said container and agitating the combination of blades and container, causing said switch contact blade tips to rub on said mercury-coated

container bottom, to coat the tips of the switch contact blades with mercury and cause some amalgamation of the second layer of gold to occur;



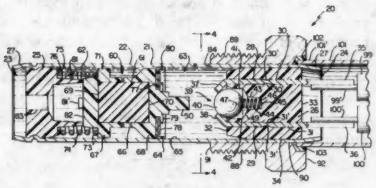
heating the blades in a second heating step to cause further amalgamation of said second gold layer to occur.

4,630,360

METHOD OF MAKING DIFFERENTIAL PRESSURE OPERATED ELECTRICAL SWITCH

Rolf H. Ochsner, Trumbull, and Charles J. Everett, Clinton, both of Conn., assignors to Robert Shaw Controls Company, Richmond, Va.

Filed Apr. 15, 1985, Ser. No. 723,065
Int. Cl.[4] H01H *35/38*
U.S. Cl. 29—622 **9 Claims**



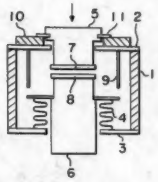
1. In a method of making a differential pressure operated electrical switch construction having a housing means carrying a pair of rigid terminals that have body portions thereof disposed substantially parallel to each other and an electrical switch means for electrically interconnecting said terminals together when said switch means is in one operating condition thereof and for electrically disconnecting said terminals from each other when said switch means is in another operating condition thereof, said method comprising the steps of disposing actuator means in said housing means so as to be responsive to differential pressures acting across the same, and operatively associating said actuator means with said switch means to cause said switch means to be in said one condition thereof when having a certain differential pressure acting across the same and to cause said switch means to be in said other condition thereof when having another certain differential pressure acting across the same, the improvement comprising the steps of bending the free ends of said terminals toward each other so that said free ends are each disposed at an angle relative to said body portion of its respective terminal, forming said switch means to comprise a movable contact member and a biasing means operatively associated with said contact member for urging said contact member into bridging contact with said free ends of said terminals and thereby cause said switch means to be in said one condition thereof and for permitting said contact member to be moved out of engagement with said free ends of said terminals and thereby cause said switch means to be in said other condition thereof, and disposing said contact member and said biasing means between said terminals before the step of bending said free ends of said terminals whereby said step of bending said free ends of said terminals confines said contact member and said biasing means between said terminals.

4,630,361

PROCESS FOR PREPARING A VACUUM SWITCH TUBE

Kouichi Inagaki, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 662,152
Claims priority, application Japan, Oct. 24, 1983, 58-198655; Mar. 6, 1984, 59-43134
Int. Cl.[4] H01H *11/00*
U.S. Cl. 29—622 **13 Claims**



1. A process for preparing a vacuum switch tube having a vacuum envelope having both ends closed by end plates in which a stationary electrode and a movable electrode are placed opposing each other and an electric path is opened and closed by the connection and disconnection of said electrodes, comprising the steps of:

providing a pre-assembled vacuum switch tube having a clearance between an opening of one of said end plates of said vacuum envelope and a stationary electrode rod passing through said opening and connected to said stationary electrode;

forming an enlarged diameter part in said stationary electrode rod at a position where said rod extends outside of said one of the end plates to the outside of said vacuum envelope;

forming a step at said opening of said one of said end plates;

spacing said enlarged diameter part from said one of said end plates by arranging at least one piece of non corrugated plate-like brazing material between said enlarged diameter part and radially outer portion of said step at said end plate over less than the entire length of said clearance;

putting said pre-assembled vacuum switch tube into a vacuum furnace; and

evacuating air and raising temperature in said vacuum furnace to connect said stationary electrode rod to said end plate by melt-bonding said brazing material.

4,630,362

APPARATUS FOR INSTALLING ELECTRICAL ON FLAT CONDUCTOR CABLE

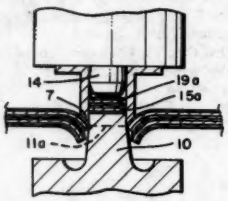
Alajos Z. Bauer, Norwalk, and Michael A. Verespej, Trumbull, both of Conn., assignors to Burndy Corporation, Norwalk, Conn.

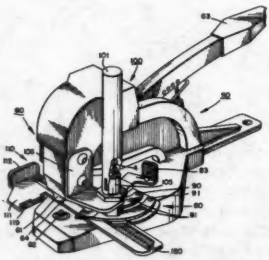
Continuation of Ser. No. 314,966, Oct. 26, 1981, abandoned. This application Mar. 27, 1985, Ser. No. 716,600
Int. Cl.[4] H01R *43/045*
U.S. Cl. 29—751 **16 Claims**

1. Apparatus for installing connectors onto flat conductor cables having a plurality of spaced conductors comprising:

(a) a supply of one piece connectors, each of said connectors being formed of an electrically conductive material and being of a one piece construction;

(b) means for locating a predetermined one of the conductors of the flat conductor cable at an installation station;
(c) means for removing a single connector from the supply and aligning the single connector with the predetermined conductor and
(d) means for pressing the single connector into the flat conductor cable and into physical contact and electrical contact with the predetermined conductor, the means for





pressing including a fixed anvil means and a ram means movable toward the fixed anvil means for moving a single connector through the flat conductor cable and predetermined conductor and into contact with the fixed anvil whereby the single connector is deformed into the flat conductor cable so that the connector is secured to the flat connector cable and predetermined conductor and electrical current can pass from the predetermined conductor to the connector.

4,630,363

SEALED NUT AND PANEL ASSEMBLY APPARATUS

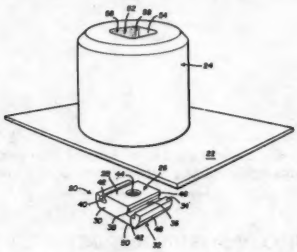
Harold T. Woods, Livonia, Mich., assignor to Multifastener Corporation, Southfield, Mich.

Division of Ser. No. 397,756, Jul. 13, 1982, Pat. No. 4,484,385. This application Apr. 15, 1985, Ser. No. 700,799
Int. Cl.[4] B23D *19/00*
U.S. Cl. 29—798 **2 Claims**

1. An apparatus for forming a low pressure fluid sealed nut and panel assembly, comprising:

a self-piercing nut having a rectangular pilot including a top face for piercing an opening in the panel, said nut having end walls generally perpendicular to said top pilot face and flange portion on opposed sides of said pilot, said flange portions having bearing surfaces lying in a plane spaced from said pilot top face and said nut having grooves on opposed sides of said pilot in said flange bearing surfaces, said grooves having an inner side wall adjacent said pilot, a bottom wall and an outer side wall extending to said flange bearing surfaces,

a die member having a generally rectangular opening configured to closely receive said nut pilot portion and cooperating with said nut pilot portion to pierce a slug from a panel received between said self-piercing nut and said die member, the width between the opposed end walls of said die member opening receiving said nut being less than the width of said nut pilot between said end walls and said die opening having arcuate corners, said die member end walls and corners sheering and deforming said pilot nut edges at said end walls and corners simultaneously sheering and deforming the top four corners of the nut pilot toward the plane of the flange bearing surfaces forming a panel bearing surface on said pilot receiving the main portion of said panel spaced below said pilot top face and extending the length of said nut end walls and around said pilot corners into said grooves with the pierced edges of said panel supported on said nut pilot bearing surface in sealed relation, and said die member including upstanding



elongated clinching lips on opposed sides of said die opening, said clinching lips being truncated including a flat top portion and tapered side walls, including tapered inner side walls receiving said pierced panel edges and deforming said edges into said grooves against said nut inner groove side walls in sealed relation spaced from said groove bottom wall, and said clinching lip top walls deforming said panel against said groove bottom walls, the panel portion deformed in said nut grooves thereby being continuous with said main panel portion and said panel being in sealed engagement with said bearing surfaces of said nut pilot and flanges, providing a continuous low pressure seal between said nut and said panel.

4,630,364

APPARATUS FOR APPLYING FASTENER TAPE TO FABRIC PIECES

Leo W. Fyfe, Nashville, and A. Matthew Seaman, Brentwood, both of Tenn., assignors to Cutters Exchange, Inc., Nashville, Tenn.

Filed May 1, 1985, Ser. No. 729,258
Int. Cl.[4] B23P *21/00*
U.S. Cl. 29—779 **8 Claims**

1. An apparatus for securing a pair of fastener tapes, having cooperative faces, to a pair of fabric pieces, each piece having a longitudinal edge, and to each other, comprising:

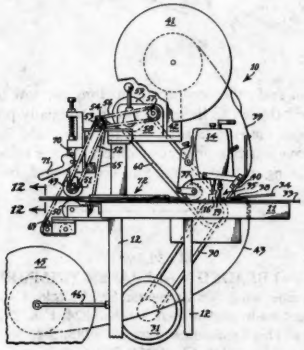
(a) applicator means for securing a first elongated fastener tape face up to a first fabric piece along the longitudinal edge of said first fabric piece, and for securing a second elongated fastener tape face down to a second fabric piece along the longitudinal edge of said second fabric piece, at an applicator station, said applicator means having front and rear portions,

(b) first guide means for guiding said first and second fabric pieces, during movement of said fabric pieces in a longitudinal rearward direction through said applicator station, and in a substantially coplanar position in which the longitudinal edges of said fabric pieces oppose each other.

(c) second guide means for guidings said first fastener tape above said first fabric piece and along the longitudinal edge of said first fabric piece, and guiding said second fastener tape below said second fabric piece and along the longitudinal edge of said second fabric piece, during

movement of said fastener tapes in said longitudinal rearward direction through said applicator station,

(d) rear guide means for guiding said first and second fabric pieces away from said applicator station, said rear guide means being spaced longitudinally rearward of said applicator station and including a lower rear elongated guide member and an upper rear elongated guide member, each of said guide members having front and rear end portions, and each of said guide members comprising an elongated guide element, each guide element being on a longitudinal side of its respective guide member, said guide elements limiting edgewise movement of the fabric pieces guided by said guide members,



(e) mounting means mounting said upper rear guide member above and at an angle to said lower rear guide member, said front end portions being spaced transversely of each other relative to said longitudinal direction, and said rear end portions being in substantial vertical alignment with each other,

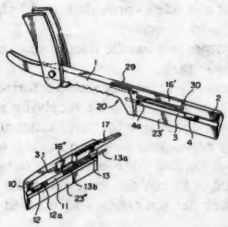
(f) draw means for pulling said first and second fabric pieces into an overlapping relationship from said rear end portions of said lower and upper guide members with said first and second fastener tapes having their opposing cooperative faces in substantially vertical alignment with each other, and for compressing said fastener tapes together to secure said cooperative faces in cooperative engagement, said draw means being behind said rear end portions of said upper and lower guide members.

4,630,365

BLADE REPLACEABLE TYPE BARBER RAZOR

Yoshikatsu Imaizumi, Kanagawa, Japan, assignor to Warner-Lambert K.K., Tokyo, Japan

Filed Apr. 19, 1985, Ser. No. 725,001
Claims priority, application Japan, Oct. 11, 1983, 58-155772
Int. Cl.⁴ B26B *21/10*
U.S. Cl. 30—53 **7 Claims**



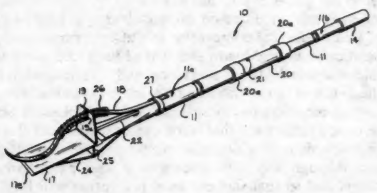
1. In a blade replaceable type barber razor including a razor body comprising a handle portion and a first blade holder half made integral with said handle portion, a second blade holder half engaged by a hinge connection to said first blade holder half for clamping a blade between a first blade clamping surface of said first holder half and a second blade clamping surface of said second holder half, said second blade holder half serving as a cover for the razor body and a slidable wedge slidably in a slide groove extending substantially in parallel with the axis of the hinge connection, in ridge portions of both the blade holder halves, said slidable wedge having an opposing pair of side surfaces which are brought in wedging engagement to inner side wall surfaces of the slide groove, wherein at least one of the first holder half and the second holder half has hinge pins fixedly secured thereto which are adapted to be inserted into associated pin holes on at least one of the second holder half and the first holder half so that the first holder half and the second holder half are engaged to one another by said hinge connection about the hinge pins inserted in the pin holes by sliding movement of the second holder half relative to the razor body, the improvement consisting in that a recess is provided in the corner area as defined between a forward end face of the slide groove and the inner wall surface of the first holder half located opposite to the first blade clamping surface and a rigid projection, projected from the inner wall surface of the second holder half toward the first holder half to come in engagement with said recess, is provided in the corner area as defined by the forward end face of the slide groove and the inner wall surface of the second holder half located opposite to the second blade clamping surface and that the height of said rigid projection is so determined that when no blade is clamped between the first and second holder half, the projection is allowed to move out of engagement with the recess by movement of the second holder half around the hinge connection relative to the first holder half, but when a blade is clamped, the projection comes in engagement with the recess.

4,630,366

WEED CUTTING AND EXTRACTING TOOL

Merle A. Fry, 201 S. Waverly Rd., Apt. A-18, Lansing, Mich. 48917

Filed Jan. 21, 1986, Ser. No. 820,701
Int. Cl.⁴ A01B *1/16*; B66F *3/00*
U.S. Cl. 30—124 **20 Claims**



9. An improved tool for cutting and extracting weeds from the ground which comprises:

(a) an elongate shaft means having a longitudinal axis with opposed first and second ends along the axis;

(b) a flat blade means having top and bottom ends and top and bottom sides mounted on the first end of the elongate shaft means parallel to the axis, wherein the bottom end of the blade means has a weed cutting edge;

(c) a flat retaining spring means with a connected end attached to the first end of the elongated shaft and with a free end extending from the connected end over the top side and between the top and bottom ends of the blade so as to be in contact with the blade adjacent the cutting edge and curved away from the cutting edge at the free end wherein the weed is grasped between the blade means and the flat spring means during and after cutting of the weed by the blade;

(d) an ejector plate means moveably mounted adjacent the top side of the blade so as to be linearly moveable towards and back from the bottom end of the blade parallel to the axis and supporting the flat spring, wherein the flat spring is lifted from contact with the blade when the ejector means is moved towards the bottom end to eject the weed grasped between flat spring means and blade means from the tool; and

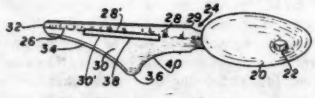
(e) a linearly moveable handle means mounted between the first and second ends and along the axis of the elongate shaft means and connected to the ejector plate means to move the ejector means towards and away from the bottom end of the blade means.

4,630,367

PRODUCE KNIFE WITH DEPTH-LIMITING AND PEEL AIDING FENCE

David Pressman, 1237 Chestnut St., San Francisco, Calif. 94109, and Victor H. Goulter, 485 Molimo Dr., San Francisco, Calif. 94127

Filed Jun. 18, 1984, Ser. No. 621,607
Int. Cl.[4] B26B *3/00*
U.S. Cl. 30—279 R **7 Claims**



1. A knife for making cuts of controlled predetermined, variable depths for cutting through orange skins or the like which have a thickness within a predetermined range, comprising, in combination:

an elongated, flat, side-cutting blade, one elongated edge thereof being sharpened, said blade having a tip at a distal end thereof and a heel at a proximal end thereof,

a handle, at said heel of said blade, for manually holding said blade at said heel thereof so that said blade extends out of said handle and so that said sharpened edge of said blade can be manually used to cut at least partially through an object in a cutting direction which is generally perpendicular to said direction of elongation of said edge and parallel to the plane of said blade, and

fence means (a) mounted on and attached to at least one side of said blades, (b) comprising an outward protrusion perpendicular to said blade and spaced back and away from said sharpened edge of said blade, and (c) arranged to limit the depth of cut which can be made by said blade in said cutting direction to any selected value within said predetermined range such that blade can be used to cut through produce skins in a direction perpendicular to such skins and through any skin thickness in said predetermined range, and so that said outward protrusion will limit the depth of cut which can be made by said blade to any selected value within said predetermined range without cuttng into the flesh of said orange skin or the like,

said outward protrusion comprising a tongue portion for facilitating peeling of an orange rind,

whereby said blade can be used to cut directly through produce skins of any thickness within said predetermined range without cutting into the flesh thereof.

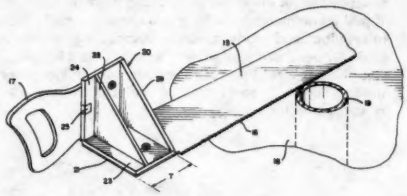
4,630,368

FLUSH CUT HANDSAWS

Lewis B. Izzi, Sr., Shelby, N.C., assignor to Plastic Oddities, Inc., Shelby, N.C.

Filed Mar. 11, 1985, Ser. No. 710,230
Int. Cl.[4] B26B *29/00*
U.S. Cl. 30—289 **2 Claims**

1. A flush cut saw comprising in combination, a flat saw blade, handle mounting means comprising two walls at substantially a right angle to each other, said walls forming two outer flat rectangular surfaces, said blade being affixed to one of said walls on the flat outer surface thereof, a handle affixed to the other of said walls positioned substantially parallel along



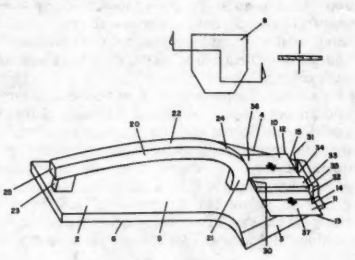
the plane of said other wall for propelling the saw blade with said handle oriented to lie in a plane substantially perpendicular to the saw blade to position the flat saw blade flush on the surface above which a projecting object is to be removed, said flat blade being in flush contiguous contact with the surface.

4,630,369

TWO BLADED WALLPAPER TRIMMER

Tommy E. Bourland, 308 Barcelona St., Vallejo, Calif. 94591

Continuation-in-part of Ser. No. 583,824, Feb. 27, 1984, abandoned. This application Aug. 19, 1985, Ser. No. 766,682
Int. Cl.[4] B26B *29/00*
U.S. Cl. 30—294 **8 Claims**



1. A handtool for close edge cutting and trimming of sheet material, the tool being of the pull-type intended for manual use and pulled toward the user in a forward direction during the cutting and trimming action, said tool comprising:

a base plate having an upper side and a flat underside for slidably engaging the sheet material and maintaining secure pressure against the material;

the base plate having a triangular shape and being beveled along at least one side to provide a guide edge for creasing the material into a corner;

an upwardly projecting handle fixedly secured to the upper side of the base plate;

a pair of horizontally extending recesses formed in the upper side of the base plate each for receiving a cutting blade separated by a dividing strip that locates the blades;

a cutting blade removably mounted in each of said recesses and having a cutting edge extending outwardly beyond said guide edge to cut the material while it is being engaged by said flat underside and creased by said guide edge; and

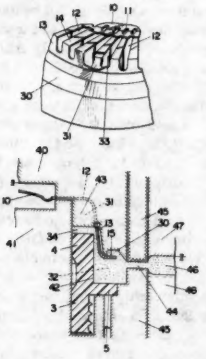
means for securedly removably holding the cutting blade within said recess.

4,630,370

OUTER CUTTER ASSEMBLY FOR AN ELECTRIC SHAVER

Toshikazu Hamada, Hikone, Japan, assignor to Matsushita Electric Works, Ltd., Japan

Filed Jun. 20, 1985, Ser. No. 746,836
Claims priority, application Japan, Jun. 20, 1984, 59-126819
Int. Cl.⁴ B26B *19/14*
U.S. Cl. 30—346.51 **5 Claims**



1. An outer cutter assembly for an electric shaver which comprises:

an outer shearing foil formed with a plurality of hair entrance peripheral perforations arranged along the periphery thereof to be in hair shearing relation with an inner blade sliding against the inner surface of the outer shearing foil;

a base frame on which the outer shearing foil is mounted with its peripheral edge supported thereby;

a comb forming plastic member provided between the peripheral edge of the outer shearing foil and the upper end of the base frame to have its lower portion connected to the base frame, said comb forming member being provided at its upper portion with a comb having teeth defining between the adjacent ones thereof slits each of which is in open communication with one of the peripheral perforations as well as located inside of the outer shearing foil, the teeth being in alignment with each of a plurality of webs separating adjacent ones of the peripheral perforations;

adjoining means for bringing each of the teeth in intimate contacting relation with each corresponding one of the webs to thereby prevent the presence of any gap therebetween;

said base frame being formed at its upper end with a projection which defines said adjoining means projecting into said comb forming member to separate the comb from the lower portion of the comb forming member in such a way that the upper portion undergoes shrinkage upon its solidification substantially independently of the shrinkage in the lower portion of the comb forming member, whereby the comb is subjected to a lesser amount of shrinkage so as to assure an intimate contacting relation between the teeth of the comb and the webs of the outer shearing foil.

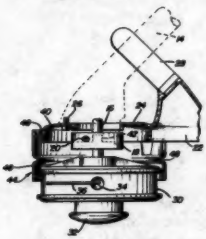
4,630,371

LINE TRIMMER SHIELD

Andrew J. Graham, R.F.D. 1, Box 323, Todd, N.C. 28684

Filed Feb. 6, 1986, Ser. No. 826,100
Int. Cl.⁴ A01G *3/06*
U.S. Cl. 30—347 **8 Claims**

1. In combination with a line trimmer head assembly including a sector-shaped debris shield radiating outward therefrom and wherein the apex end portion of the shield terminates in a rounded base portion having a central aperture formed therethrough and secured to the underside of the head with a line reel mounting shaft end portion extending downwardly from the head, projecting through the aperture and having a "bumping" type line release line reel head mounted thereon beneath said rounded base portion, a tall grass and/or weed entanglement shield comprising an upright axially short sleeve member



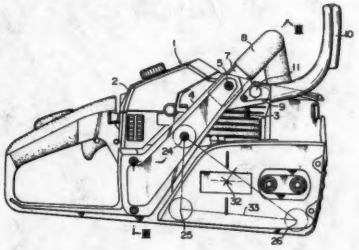
including an upper end extending about and mounted from the outer periphery of said base portion, said upper end including upwardly opening peripherally spaced notch means formed therein registered with, providing clearance for and receiving adjacent portions of the apex portion of said debris shield therein, said sleeve member including a lower end Projecting downward from said debris shield and loosely telescopingly engaged over the upper portion of said line reel head.

4,630,372

FRONT HANDLE SUPPORT MEANS OF PORTABLE CHAIN SAW

Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 646,922
Claims priority, application Japan, Sep. 7, 1983, 58-137811[U]
Int. Cl.⁴ B27B *17/02*
U.S. Cl. 30—381 **2 Claims**



1. Front handle support means of a portable chain saw having a built-in internal combustion engine serving as a power source, comprising:

a handle support arm connected to one lateral side of a machine frame and extending upwardly, said handle support arm having an upper end secured to one end of a handle pipe of a front handle;

a projection formed integrally at an upper end portion of the handle support arm and extending forwardly to pivotally support a hand guard;

said hand guard having integrally formed therewith an arm for cooperation with an actuating lever of a brake band, whereby forward movement of said hand guard effects

rearward movement of said arm to move said brake band actuating lever and effect braking of the chain saw; and

shock absorber means mounted on an inner side of said handle support arm to connect the internal combustion engine therethrough to the machine frame.

4,630,373

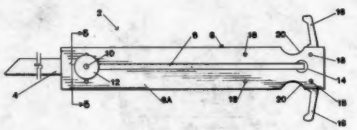
RETRACTABLE UTILITY SAW

Robert A. Staurseth, Rte. #1, Box 426, Poplar, Wis. 54864

Filed Apr. 29, 1985, Ser. No. 728,340

Int. Cl.[4] B23D *45/00*

U.S. Cl. 30—514 **8 Claims**



2. A hand utility saw comprising:

a saw blade having a proximal and a distal end and a plurality of saw teeth disposed along at least one edge thereof;

an elongated handle comprising first and second handle portions, said first handle portion including a lengthwise extending saw blade receiving slideway recessed into an interior surface thereof and a slot through said first handle portion coextensive over a portion of and transverse to said slideway, said second handle portion including an interior blade storage cavity, and wherein said slideway and said storage cavity mount in opposed facing relation to one another;

means mounted to said saw blade in said slideway and through said slot for securing said saw blade to said first handle portion, upon achieving a desired exposure of said saw blade from said handle.

4,630,374

BRIDGE TYPE COORDINATE MEASURING MACHINE

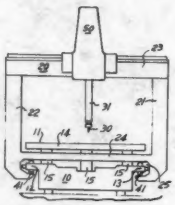
Freddie L. Raleigh, Centerville, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Jan. 24, 1985, Ser. No. 694,377

The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.

Int. Cl.[4] G01B *7/28*

U.S. Cl. 33—1 M **13 Claims**



1. A bridge type coordinate measuring machine of the type having a base (10) having a horizontal table surface (11) for supporting a work piece to be measured, a bridge (20) having a closed loop configuration that extends around said table surface (11), by passing above and below the table surface (11) of said base (10), said closed loop configuration formed by two uprights (21, 22) extending vertically above and below the level of said table surface, a first horizontally extending member (23) joined at one end to one of the uprights (21, 22) and joined at the other end to the other of said uprights so as to extend across and above the table surface (11) of said base (10), and a second horizontally extending member (24) joined at one end to one of said uprights, and joined at the other end to the other of said uprights, so as to move with said bridge along said first horizontal axis, means (25, 12, 13, 41) for mounting the bridge (20) to the base for movement along a first horizontal axis including horizontally extending guideways (12, 13) supporting said bridge and along which the uprights (21, 22) of the bridge (20) move; the second horizontal extending member (24) located at a vertical level below the table surface (11) of said base (10) and above the vertical level of the ways (12, 13) a probe (30); means (50, 31) for mounting said probe (30) on said first horizontal member (23) of said bridge (20) for movement along a second horizontal axis and a vertical axis, said first and second horizontal axes and said vertical axis orthogonally arranged, said mounting of said bridge and said probe thereby enabling movement of said probe about orthogonal axes to measure distances on a workpiece positioned on said table surface (11) of said base (10), the means for moveably mounting the bridge (20) to the base (10) characterized by:

a pair of said guideways (12, 13), each one thereof coacting with a respective plurality of bearings (41), said guideways and bearings located below the upper table surface (11), one (12) of said guideways and its respective bearings (41) located at one side of said base (10) and the other (13) of said guideways and its respective bearings located at the opposite side of said base (10), one of said guideways (12) having a sidewardly facing surface that faces in the opposite direction of a sidewardly facing surface of the other guideway (13), so that the bearings (41) apply forces in opposite directions against the uprights (21, 22) of the bridge (20).

4,630,375

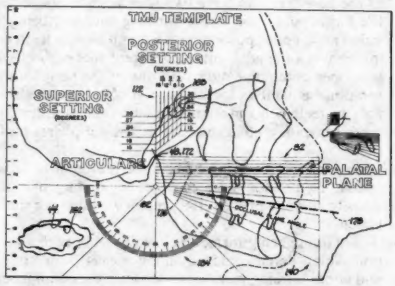
APPARATUS FOR GAUGING AND DETERMINING SPATIAL COORDINATES FOR A SOURCE OF RADIATION TO BE EMPLOYED IN OBTAINING A RADIOGRAPH OF A PATIENT

John L. Spolyar, 2769 Homewood Dr., Troy, Mich. 48098

Filed May 2, 1985, Ser. No. 729,614

Int. Cl.[4] G01B *11/28*

U.S. Cl. 33—1 B **7 Claims**



1. Apparatus for gauging and determining the spatial or angular position of the axis of an X-ray source relative to a patient's head for purposes of obtaining a least obstructed X-ray exposure of the patient's TMJ in an X-ray image comprising, template-like gauge means, said gauge means comprising plate-like body means, said body means at least for the most part being transparent, a reference point designation carried by said body means, reference line means carried by said body means, and a read-out portion carried by said body means, said read-out portion comprising a plurality of gauge areas, wherein when said plate-like body means is placed against an associated lateral cephalogram and said reference point is situated at the articulare of said cephalogram and the palatal plane of said cephalogram is positioned at least parallel to said reference line means the sella of the sella turcica of said ceph-

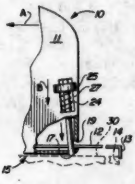
alogram appears within one of said plurality of gauge areas, and wherein said sella by its appearance within said one of said plurality of gauge areas determines a corresponding set of angular coordinates for use in positioning the radiation axis of said X-ray source for the next following X-ray exposure of said TMJ.

4,630,376

MARKING DEVICE FOR TAPE MEASURE

Randal L. Pentecost, P.O. Box 2882, Flagstaff, Ariz. 86003

Filed Apr. 26, 1985, Ser. No. 727,734
Int. Cl.[4] G01B 3/10
U.S. Cl. 33—138 **1 Claim**



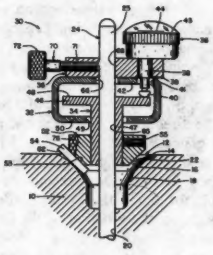
1. A measuring device including
(a) a graduated measuring tape coiled about a transverse axis;
(b) a housing for said tape, said housing including:
(i) a pair of opposed, spaced apart side walls bouding said coiled tape, said side walls having upper and lower portions,
(ii) a front wall spanning the space between and interconnecting said side walls, said front wall having an upper and a lower portion,
(iii) a top portion including said upper portions of said front and side walls,
(iv) a bottom portion including said lower portions of said front and side walls,
(v) a mouth formed through said lower portion of said front wall, said measuring tape being extended through said mouth from within said housing, and
(vi) an aperture formed in said bottom portion generally adjacent said mouth; and,
(c) an inscription unit mounted inside said housing adjacent said front wall and having
(i) an elongate member with a point for forming a mark on the surface of a workpiece,
(ii) thumb rest means extending through and outwardly from one of said side walls and operatively associated with said elongate member to move said elongate member between at least two operative positions,
a first normal operative position with said pointd positioned inside said housing behind said front wall, and
a second operative position with said point displaced downwardly from said first operative position through said aperture to a position generally directly beneath said front wall and mouth thereof,
said thumb rest means being positioned on said side wall such that an individual can pick up said housing in one hand, extend said tape from said housing to make a measurement on a workpiece, and utilize a digit of the hand to operate said thumb rest means to make a mark on the workpiece at a point directly beneath said mouth of said tape meausre,
said elongate member being canted from the vertical such that displacement of said point from said first to said second operative position forwardly displaces said point from within said housing and from behind said front wall to a position outside said housing and generally directly beneath said front wall and said mouth.

4,630,377

VALVE SEAT RUNOUT GAGE

Michael H. Schneider, Chesterfield, and Thomas J. Chadwell, Warson Woods, both of Mo., assignors to Sunnen Products Company, St. Louis, Mo.

Filed Oct. 17, 1985, Ser. No. 788,492
Int. Cl.[4] G01B 5/24
U.S. Cl. 33—181 AT **13 Claims**



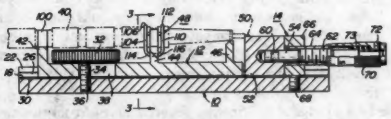
1. A gage for indicating the runout condition of a valve seat edge formed by and between adjacent valve seat surfaces of a valve seat adjacent one end of a valve guide bore and concentric with the axis thereof, the valve guide bore accommodating an elongated pilot member that extends therefrom through the valve seat surfaces, said gage comprising a housing member adapted to be mounted on the pilot member in fixed spaced relationship from the valve seat, dial indicator means mounted on the housing at a location spaced radially from the pilot member, said dial indicator means having a plunger member extending therefrom substantially parallel to the pilot member and indicator means operatively connected to the plunger member and movable in response to movements of the plunger member to produce a visual indication as to the position of the plunger member, a work engaging member mounted for rotatable and axial movement on the pilot member in the space between the housing and the valve seat, said work engaging member including an annular portion and an elongated member mounted thereon at an angle for slidable engagement with the valve seat edge whose runout is to be indicated, said work engaging member having a second portion including an end face slidably engageable with the plunger member whereby rotation of the work engaging member when the elongated member is engaged with the valve seat edge translates into movements of the plunger member to produce indications as to the runout of the valve seat edge on the dial indicator means.

4,630,378

GAUGE FOR EXTENSIBLE-BLADE SURGICAL KNIFE

Rodney J. Kulp, Harleysville, and Andrew J. Furey, Philadelphia, both of Pa., assignors to Pilling Co., Fort Washington, Pa.

Filed Jun. 13, 1985, Ser. No. 744,407
Int. Cl.[4] B27G 23/00
U.S. Cl. 33—185 R **10 Claims**



1. A gauge for facilitating adjustment of the extent to which the blade tip of an extensible-blade surgical knife projects beyond the end of a cutting depth limiting foot attached to the body of the knife comprising:
a base having guide means;

a cradle slidably supported on said base and guided by said guide means;

means on the cradle for holding the body of an extensible-blade surgical knife so that the cutting edge of the blade lies in a plane parallel to the direction of extension and retraction of the blade and fixed with respect to the cradle;

gauge means on said base comprising a gauge element having an edge located closely adjacent to said plane and substantially parallel thereto, said edge extending transverse to the direction of extension and retraction of the blade, said gauge element being capable of movement relative to the base parallel to said plane, through a range of positions including a reference position fixed with respect to the base, so that a projection of said edge onto the blade, in a direction perpendicular to said plane, is movable in the direction of extension and retraction of the blade as the gauge element moves, and indicator means providing a reading of the position of said gauge element relative to the reference position; and

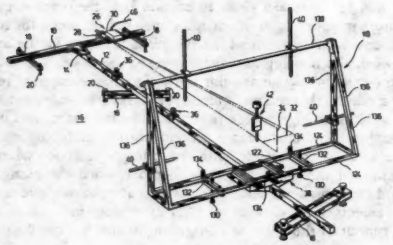
releasable means for fixing the cradle with respect to the base, thereby fixing the location of the cradle relative to said reference position of the gauge element while allowing said movement of the gauge element relative to the base.

4,630,379

LASER GAUGING SYSTEM AND COMPONENT PARTS THEREFOR

John T. Wickmann, Omemee, and Richard Olak, Peterborough, both of Canada, assignors to Chart Industries Limited, Ontario, Canada

Filed Sep. 2, 1983, Ser. No. 529,201
Int. Cl.[4] G01B 5/255
U.S. Cl. 33—288 20 Claims



1. A laser gauging apparatus for measuring a vehicle during construction of and repair of said vehicle, said apparatus comprising:

support means positionable below said vehicle;

laser means mounted on said support means for projecting said least one horizontally extending beam portion beneath said vehicle, said horizontal beam portion defining a horizontal datum plane under said vehicle from which measurements to said vehicle are obtainable, said laser means additionally projecting a vertical beam portion which defines a vertical datum plane, said support means comprising a first elongate rail means, said laser means including a laser adjustably mounted on a first carriage means, said first carriage means being slidable along said first elongate rail means;

second elongate rail means secured at right angles to said first rail means for extending beneath the centerline of said vehicle, said second elongate rail means being adapted to carry measuring instruments, adjustable support means for horizontally supporting said first and second rail means above a base; a

second carriage means slideable along said second elongate rail means, said second carriage means including a beam splitting laser target comprising:

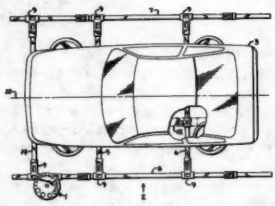
a housing adjustably mounted thereon, said housing havig first opposing slots in alignment with the direction of projection of the laser beam portions, said housing having second elongate slots located at right angles to said first opposing slots, at least two beam splitting means mounted in said housing to deflect portions of said vertical beam portion entering one of said first opposing slots in different directions through the other of said second elongate slots, the remainder of the vertical beam portion and portions of the horizontal beam portion passing through said beam splitting laser target.

4,630,380

HOLE GAUGE

Robert L. Donahue, McPherson, Kans., assignor to Hein-Werner Corporation, Waukesha, Wis.

Filed Feb. 28, 1986, Ser. No. 835,110
Int. Cl.[4] G01B 5/25
U.S. Cl. 33—288 6 Claims



1. A hole gauge arrangement for determining the distance of a fixture hole relative to a datum plane, said arrangement comprising:

(a) an elongate set rod with a measurement scale thereon;

(b) die means mounted to and extending outwardly from a remote end of said set rod;

(c) a first gauge mount with said set rod extending therefrom, each said gauge mount including means for connection to a support structure and an adjustable rod holder means for setting an extension of said rod relative to said gauge mount;

(d) an elongate measurement rod having a tip end; and

(e) a second gauge mount positionable against said first gauge mount with said measurement rod extending therefrom, said second gauge mount being connectible to said support structure and said measurement rod being extensible through said second gauge mount so that said tip end encounters said die means, whereby the height of said measurement rod is set to the height of said set rod, said second gauge mount with said measurement bar thereon being transferrable to a support structure located in a datum plane and positionable thereon aligned with a fixture hole, whereby the spatial relationship of said tip end to said fixture hole is determined.

4,630,381

COORDINATE MEASURING INSTRUMENT

Hideo Sakata, and Eiichi Tsunoda, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1985, Ser. No. 753,305
Claims priority, application Japan, Jul. 24, 1984, 59-154784; Jul. 24, 1984, 59-154785
Int. Cl.[4] G01B 7/03
U.S. Cl. 33—503 11 Claims

1. A coordinate measuring instrument, comprising:

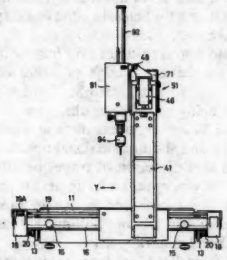
a bedplate;

a pair of elongated and parallel guide rails respectively protruded from opposite side surfaces of said bedplate;

a pair of supports respectively movably supported on said guide rails along the axial length of said guide rails, one of said supports including first means for effecting a positional adjustment in a first direction perpendicular to an upwardly facing top surface of said bedplate and a second direction perpendicularly intersecting said first direction, and the other of said supports being displaceable in said second direction and non-displaceable in said first direction, each of said supports having a first surface means thereon opposed to the other said first surface means;

a slider guide rail connected to and extending between said supports and having supported thereon a slider movable in the longitudinal direction of said slider guide rail, said slider having a measuring element;

second means for facilitating an adjustment of the position of said slider guide rail relative to said supports in at least



two directions perpendicularly intersecting each other, said second means being provided on said respective supports and including four adjusters opposed to and engaging upper and lower portions of each front and rear surfaces of said slider guide rail, said adjusters being respectively adjustable in position relative to said slider guide rail, and members for supporting an undersurface of said slider guide rail and being linearly adjustably movable in said first direction; and

a pair of positionally adjustable members fixably secured to said supports and said slider guide rail and including a third means for facilitating a relative adjustment in position between said slider guide rail and each said support, each of said adjustable members having a second surface means in face-to-face abutting relation with said first surface means on said support so that said slider guide rail is non-displaceably fixed relative to said supports in a moving direction of said slider.

4,630,382

DISCHARGE DEVICE FOR GRANULES

Manfred Keller, Neusäss; Uwe Bartsch, Wertingen; Hans-Heinrich Drösemeyer, Batzenhofen, and Franz X. Reitsam, Augsburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

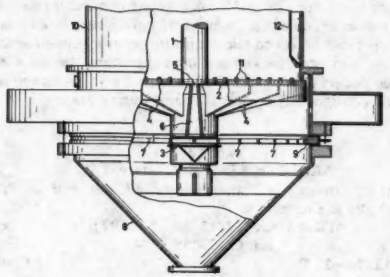
Filed Dec. 6, 1984, Ser. No. 678,981

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1983, 3344558

Int. Cl.⁴ F26B *17/34*

U.S. Cl. 34—173 **5 Claims**

1. A device for discharging granulate material comprising a vertically oriented reactor, a horizontally disposed perforated plate rotatably mounted within the reactor, scraper means on an upper surface of the plate constructed and arranged to scrape material charged into the reactor and positioned directly above the plate, at least one narrow discharge slot in the perforated plate for the passage of granulates removed by the scraper means, granulate collecting means directly below the discharge slot connected to rotate at the same rate as the perforated plate, and stationary scraping means positioned between the discharge slot and the granulate collecting means for re-



moving granulates from the granulate collecting means as the perforated plate and the collecting means rotate.

4,630,383

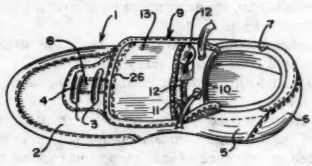
SHOE WITH GUSSET POCKET

Robert J. Gamm, Olivette, Mo., assignor to Kangaroos U.S.A., Inc., Chesterfield, Mo.

Continuation of Ser. No. 190,791, Sep. 25, 1980, abandoned. This application Jul. 25, 1983, Ser. No. 516,647

Int. Cl.⁴ A43B *23/00*

U.S. Cl. 36—136 **6 Claims**



1. An athletic shoe with a gusset normally positioned beneath the shoe lacing and other securing means, over the instep of the wearer's foot, and incorporating a pocket for holding a key, coin, and related item, comprising, said gusset incorporating a tongue, a lower portion of the tongue being located over the instep of the wearer's foot and under the lacing and other securing means on the said shoe when said shoe is being worn, an upper portion of said tongue extending above said shoe lacing, a foldable portion appended to said upper portion of the said tongue, a pocket formed in said foldable portion and capable of holding a key, coin, and related item therein, said foldable portion being foldable over against said lacing to a position wherein said pocket is adjacent said shoe when said shoe is being worn, said foldable portion of the said upper portion of the tongue and the pocket formed therein being integral, and said upper portion and said lower portion of said tongue being integrally formed, the upper portion of said tongue comprising a pair of upper and lower liners stitched along their lateral edges to form said pocket and having a width equal to the width of the tongue in which the pocket is formed, said pocket being formed having side edges, said liners extending above said lacing, and said liners folding over as the foldable portion upon said lacing to a position wherein said pocket is adjacent said shoe, an access opening permitting placement and removal of said key, coin, and related item, into and from said pocket while said shoe is being worn, closure means for closing said access opening, said closure means comprising a zipper, said access opening being provided through one of said upper or lower liners forming the said pocket, said access opening and closure means extending ap-

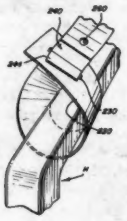
proximately from one side edge to the other side edge of said formed pocket, and releasable holding means for aiding and holding said pocket adjacent said shoe when said shoe is being worn, said releasable holding means comprising a hook and pile connector, one of said hook and pile connector attaching with the underside of the lower liner, and aligned for attaching with the other hook and pile connector securing upon the shoe eyestay, and securing means interconnecting between the formed pocket portion and the footwear for retaining the said portion contiguously against the same during usage.

4,630,384

SELF-LOCKING BAGGAGE TAG

Thomas J. Breen, Arlington Heights, Ill., assignor to Rand McNally & Co., Skokie, Ill.

Filed Jan. 31, 1985, Ser. No. 697,033
Int. Cl.[4] G09F *3/14*
U.S. Cl. 40—21 R **12 Claims**



1. A disposable tag for attachment to an articles of baggage or the like comprising:

an elongated reinforced paper product tape strip having longitudinal reinforcing fibers therein;

a locking slit formed in said strip adjacent one end edge thereof; and

locking means carried by said strip intermediate the ends thereof, said locking means comprising a locking tab mounted on one face of said strip, said locking tab comprising a separate thin paper product member which has a portion which is adhered to said strip and having a portion separated from, and unadhered to, said strip for engaging the strip adjacent said slit;

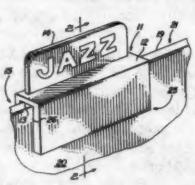
the other end edge of said strip being threadable through said slit to form a loop around a portion of an article, and said locking tab unadhered portion being engageable with the strip adjacent the slit to lock the loop closed and prevent inadvertent opening thereof.

4,630,385

RECORD ALBUM LABELING TAB

Steven M. Swim, 7634 S. 41st St., Phoenix, Ariz. 85040

Filed Dec. 10, 1984, Ser. No. 680,099
Int. Cl.[4] G09F *3/00*
U.S. Cl. 40—340 **2 Claims**



1. An index marker for panel-shaped members, said panel-shaped members each including

an edge, and

a pair of opposed generally smooth planar sufaces terminating at said edge,

said index marker including

(a) a base having a top side and a bottom side;

(b) a tab attached to said top side of and outwardly projecting from said base;

(c) a first resilient leg attached to said bottom side of and outwardly projecting from said base in a direction away from said tab and having a distal tip and an inner surface;

(d) a second resilient leg attached to said bottom side of and outwardly projecting from said base in a direction away from said tab and having a distal tip and an inner surface, said inner surface of said second leg generally being spaced apart from and opposed to said inner surface of said first leg, a portion of said bottom side of said base being between and bordered by said first and second legs;

said resilient first and second legs normally canting toward one another such that said legs are spaced farther apart from one another near said bottom side of said base than said legs are spaced apart near said distal tips thereof, said distal tips being resiliently forced apart when said edge of said panel member is inserted between said legs;

said portion of said bottom side of said base being shaped and dimensioned to receive the edge of either of a first panel member and a second panel member, said first and second panel members being of differing thickness;

said index marker being mounted on said panel member by grasping said tab and sliding said distal tips onto said smooth planar surfaces in a direction of travel parallel to said surfaces and generally perpendicular to and toward said edge;

said index marker being removed from said panel member by manually grasping said tab and pulling said index marker in a direction of travel generally away from and perpendicular to said edge and parallel to said planar surfaces of said panel member;

said distal ends of said legs sliding over said planar surfaces during installation and removal of said index marker onto and from said panel member;

said edge of each of said first and second panel members including a pair of elongate spaced apart generally parallel corners;

said portion of said bottom side of said base including first and second pairs of elongate generally parallel spaced apart corners; and

said first pair of corners of said base being sized to contact and receive said corners of said first panel member, and said second pair of corners of said base being sized to contact and receive said corners of said second panel member; and

(e) at least one aperture formed through one of said legs thereof to receive plug means to affix said index marker to one of said panel members after said edge of said panel member is inserted between said legs thereof, said plug means being secured to said panel member and extending outwardly therefrom into said aperture to prevent said aperture and said one of said legs from being displaced in a direction of travel generally parallel said planar surfaces of said panel member.

4,630,386

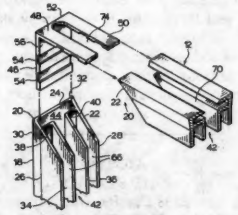
REVERSIBLE PICTURE FRAME

Arthur K. Wilson, 87 Laurentide Drive, Don Mills, Ontario, Canada (M3A 3E3)

Filed Aug. 29, 1985, Ser. No. 770,496
Int. Cl.[4] G09F *1/00*
U.S. Cl. 40—155 **3 Claims**

1. A frame for two-sided or single-sided display and exchange of pictures and posters comprising, in combination, four frame components, each frame component having an outer planar sidewall with parallel side edges, inwardly facing outer walls depending from said side wall edges substantially parallel to each other, a pair of equispaced inner walls positioned within said inwardly facing outer walls formed integral with and joined to the adjacent inwardly facing outer wall and

spaced therefrom by a pair of shoulders at their respective bases to define a longitudinal recess adjacent each outer wall and to define a longitudinal slot between the inner walls extending to the opposed outer side walls, each pair of said shoulders and opposed outer side wall together defining a transverse channel, one of said frame members having a longi-



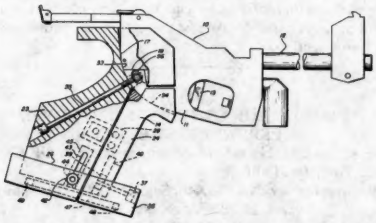
tudinal slot formed substantially from one end to the other in the outer planar side wall centrally thereof co-extensive with said slot formed between equispaced inner walls for insertion and removal of a picture therefrom, and a corner connector for insertion into the channels of adjacent frame members whereby the shoulders can be indented to frictionally engage the corner connector to form a rigid rectangular frame.

4,630,387

ADJUSTABLE PISTOL GRIP

James W. Crane, Fairport, N.Y., and Ragnar Skanaker, Ångelholm, Sweden, assignors to The Coleman Company, Inc., Wichita, Kans.

Filed Oct. 28, 1985, Ser. No. 792,259
Int. Cl.[4] F41C *23/00*
U.S. Cl. 42—73 **14 Claims**



1. A grip for a pistol having a receiver and a barrel, the grip having a width dimension which extends generally parallel to the barrel, comprising:

a palm portion adapted to be gripped by the palm and thumb of a user,

a forepiece portion adapted to be gripped by the fingers of the user,

means for adjustably securing the forepiece to the palm portion so that said width dimension of the grip can be varied by moving the forepiece relative to the palm portion, and

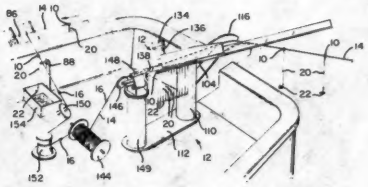
means for attaching the grip to the receiver.

4,630,388

DETACHABLE SWIVEL FOR COUPLING GANGIONS TO LONGLINES AND APPARATUS FOR AUTOMATICALLY ATTACHING SAME

Donn B. Furlong, 15427 Westwick Rd., Snohomish, Wash. 98290

Continuation of Ser. No. 658,179, Oct. 5, 1984, abandoned. This application Dec. 4, 1985, Ser. No. 805,408
Int. Cl.[4] A01K *91/04*
U.S. Cl. 43—27.4 **31 Claims**



31. A device for connecting a gangion to a continuous longline, comprising:

a stop member fixedly attached to the longline; and

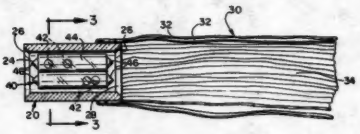
a swivel body with an aperture therethrough sized for rotatably receiving said stop member at least partially therein and a fixed sidewall opening communicating with said body aperture and sized for passage of the longline laterally therethrough for attaching and detaching of said body, said body aperture having axial end openings for passage of said stop member into and out of said body aperture from either of said end openings, said body further having means for attachment of the gangion to said body, and restraining means for releasably restraining said stop member in said body against axial movement.

4,630,389

FISH LURE

Michael Higgins, P.O. Box 95-1706, Stuart, Fla. 33495-1706

Filed Apr. 23, 1985, Ser. No. 726,098
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.22 **7 Claims**



1. A fish lure, comprising:

a tube open at each end forming a body having leading and trailing ends designed to define a streamlined body;

a plurality of sealed tubes mounted within the body, the sealed tubes having leading and trailing ends, the sealed tubes being aligned parallel to a longitudinal axis of the body; and,

a plurality of elements movably captive in the sealed tubes and a flexible skirt attached to the trailing end to the body.

4,630,390

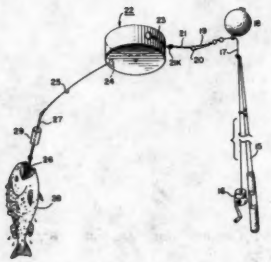
FISHING GEAR PERMITTING SWITCHING TO HEAVY LINE FOR LANDING

Ralph D. Burkeen, 1033 Crescent Ct., and Ron Labender, 440 Lakewood Ter., both of Round Lake, Ill. 60073

Filed May 29, 1985, Ser. No. 738,986
Int. Cl.[4] A01K *91/00*
U.S. Cl. 43—43.11 **12 Claims**

1. Fishing gear for fishing with a light line that permits bait

to behave normally capable of landing large fish when hooked, comprising in combination, a rotatable spool having light line and heavy line lengths attached to the spool for winding thereon in opposite directions with free ends extending from the spool, means for retaining the heavy one of the line lengths wound on the spool with a significant portion of the light line length extending from the spool during casting so that the heavy line may be unwound from the spool when a fish is hooked to wind up the light line onto the spool, means for



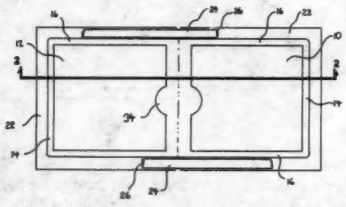
attaching the free end of the heavy line to a fishing line, and a length of heavy line with a hook attached to the end of the light line to reel onto the spool after the light line is fully wound thereon to thereby effectively provide a continuous heavy line for landing the fish coupled by the frictional force of the heavy line portion with the hook wound about the spool through the spool and the connection of the heavy line to the spool to the heavy line length thereon extending to the means for attaching to the fishing line.

4,630,391

RODENT TRAP

Arthur Meyers, 151 E. Palmetto Park Rd., Boca Raton, Fla. 33432, and Albert DeSantis, 1935 - 55 NW. 55th Ave., Margate, Fla. 33063

Filed Mar. 3, 1986, Ser. No. 835,162
Int. Cl.[4] A01M *1/10*
U.S. Cl. 43—58 **6 Claims**



1. a rodent trap comprising:

(a) a first and second closure surface, each of said surfaces having an area substantially greater than the size of the rodent to be trapped, said first and second surfaces integrally connected through a thin, flexible hinge of material therebetween, each of said closure surfaces having a recessed central area comprising most of the surface area of said closure surfaces, said recessed central area having planar floors which define a mutual relative angle therebetween in the nature of an arch relative to the floor upon which said rodent trap is placed, each of said closure surfaces further comprising:

(i) a feeding area within each of said recessed central areas, each of said feeding areas disposed proximately to said hinge joining said closure surfaces; and

(ii) a perimetric lip structure, elevated with reference to the level of said recessed central areas, and formed integrally therewith, opposing faces of said lip structure both proximate to said integral hinge forming a mutually included angle therebetween comprising a part of said arch;

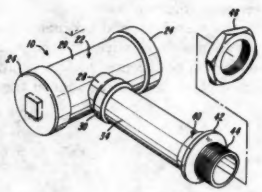
(b) elastic means secured to said lip structure and disposed transversely to said flexible hinge and upon opposite sides of said closure surfaces, each of said elastic means extending over said flexible hinge to thereby stabilize said closure surfaces in said arch, whereby the application of the weight of a rodent on said feeding area will press said arch toward the floor thereby destabilizing said elastic means and thereby causing said closure surfaces to rapidly close upon each other and about the rodent.

4,630,392

BAIT STATION

Michael J. Ferraro, 3833 Catalpa Dr., Dayton, Ohio 45405

Filed Jun. 13, 1985, Ser. No. 744,232
Int. Cl.[4] A01M *1/20, 25/00*
U.S. Cl. 43—131 **15 Claims**



1. A bait station for rodents including one section defining an enclosed bait chamber and a relatively projected entrance-exit section defining a passage into and out of said chamber, said entrance-exit section having an inner end connected to said one section and opening into said chamber and an outer end which is normally open to define the access opening to said chamber which is limited as to its cross section to exclude the passage therethrough of any object perceptibly exceeding in size the target rodents, aid one section defining one end portion of said station, said access opening being at the opposite end of said station which is most remote from said chamber, said one section being defined by plastic tubing closed by cap means at least a portion of which is releasably secured thereto and said plastic tubing having a single access opening connected at the outer surface thereof to one end of a tube element which is anchored thereto and extends therefrom to define said entrance-exit section.

4,630,393

PRODUCTION OF HYBRID "IMPROVED SUPERSWEET" SWEET CORN

Peter A. Bonucci, Northfield, Minn., assignor to UF Genetics, Inc., Hollister, Calif.

Continuation of Ser. No. 653,446, Sep. 21, 1984. This application Oct. 22, 1985, Ser. No. 789,930
Int. Cl.[4] A01G *1/00*
U.S. Cl. 47—58 **8 Claims**

1. A method for producing a hybrid sweet corn comprising the steps of:

(a) selecting a first shrunken sweet corn homozygous for sh_2, wherein said shrunken sweet corn can be genotypically represented as:

$$Su_1Su_1sh_2sh_2;$$

(b) selecting a second, sugary-shrunken, corn which can be genotypically represented as:

$$su_1su_1sh_2sh_2;$$

(c) crossing said first corn as either parent with said second corn as the other parent, to produce a hybrid sweet corn which is heterozygous and genotypically represented as:

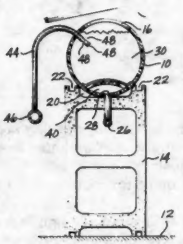
$Su_1su_1sh_2sh_2$.

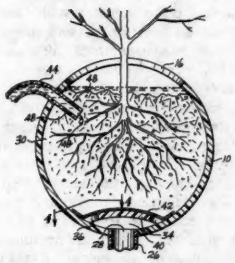
4,630,394

SUBIRRIGATION GRAVEL CULTURE GROWING BED

Michael W. Sherard, 25801 128th Pl. S.E., Kent, Wash. 98031

Filed Sep. 17, 1984, Ser. No. 650,696
Int. Cl.[4] A01G *31/00*
U.S. Cl. 47—59 **10 Claims**





1. A subirrigation gravel growing bed comprising:
an elongated, open top, growing bed container having a laterally concave bottom;
an elongated false bottom in said container spaced above the concave bottom of the container, so as to define an elongated space below the false bottom;
an elongated gravel growing bed above the false bottom;
said false bottom including openings permitting solution movement both upwardly and downwardly between the space below the false bottom and the gravel growing bed above the false bottom;
an inlet/outlet port in a bottom portion of the container, communicating with the space below the false bottom;
means for introducing a water/nutrient solution through the inlet/outlet port into the space below the false bottom, in an amount sufficient to cause such water/nutrient solution to move upwardly through the openings in the false bottom into the gravel growing bed above the false bottom;
means for draining the water/nutrient solution from the gravel growing bed, through the openings in the false bottom, into the space below the false bottom, and then out through said inlet/outlet port,
said false bottom being formed at least in part by a sheet of foraminous fabric material, said fabric material including means comprising openings of a size which allow water/nutrient solution to pass through but which block the plant roots, so that the false bottom will separate the plant roots from any pools of water/nutrient solution which may form on the concave bottom of the container following drainage of the water/nutrient solution out through the inlet/outlet port.

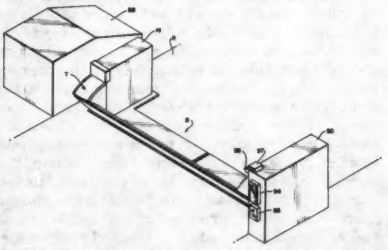
10. A method of growing plants, comprising:
providing an elongated, open top, growing bed container having a laterally concave bottom;
providing in said container an elongated false bottom spaced above the concave bottom of the container, so as to define an elongated space below the false bottom;
providing an elongated gravel growing bed above the false bottom;
providing in the false bottom openings for solution flow between the space below the false bottom and the gravel growing bed above the false bottom;
providing an inlet/outlet port in a bottom portion of the container, communicating with the space below the false bottom;
placing plants in the gravel growing bed;
periodically introducing a water-nutrient solution through the inlet/outlet port, into the space below the false bottom, in an amount sufficient that such water/nutrient solution will flow upwardly through the openings in the false bottom and then upwardly through the gravel growing bed;
continuing the introduction of water/nutrient solution into the inlet/outlet until such solution rises in the gravel growing bed up to a predetermined level;
then discontinuing the introduction of water/nutrient solution;
then draining the water/nutrient solution which has been introduced into the gravel growing bed to drain out from the gravel growing bed, through the openings in the false bottom, through the space below the false bottom, and out through the inlet/outlet; and
providing additional openings in the false bottom by utilizing as a component of said bottom a sheet of foraminous fabric material which includes openings of a size which allow water/nutrient solution to pass through but which substantially block plant roots, so that the plant roots will be kept away from any pooling of solution which might occur in the region below the false bottom, following draining of the water/nutrient solution out from the gravel growing bed.

4,630,395

PORTABLE VEHICLE BARRICADE OR PORTABLE MAXIMUM SECURITY BARRIER

Ralph G. Nasatka, 8405 Dangerfield Pl., Clinton, Md. 20735

Filed Jul. 29, 1985, Ser. No. 760,091
Int. Cl.[4] E01F *13/00*
U.S. Cl. 49—49 **20 Claims**



1. A portable vehicle barrier for positioning in a roadway or the like comprising:
(a) first and second spaced stanchions;
(b) plate means extending between said spaced stanchions;
(c) means for securing said barrier to the roadway;

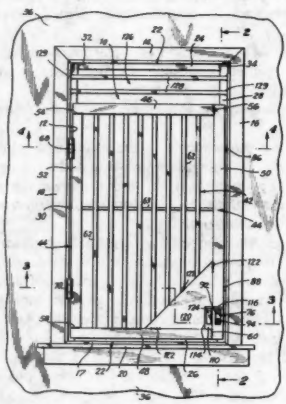
(d) hinged gate means;
(e) said gate means being attached to said plate means;
(f) means in at least one of said stanchions for raising and lowering said gate means between a first generally horizontal position and a second angularly disposed position; and,
(g) anti-tampering means associated with said stanchions and said gate means, said anti-tampering means being fixed to said gate means and movable relative to said stanchions, for preventing unauthorized interference with the raising and lowering of the gate means.

4,630,396

SECURITY GATE APPARATUS

Zadok Zvi, Fort Lee, N.J.; Abraham Kendi, and Emile Tal-Mor, both of New York, N.Y., assignors to Kendi Security, Inc., New York, N.Y.

Filed Apr. 24, 1985, Ser. No. 726,845
Int. Cl.[4] E06B *3/68*
U.S. Cl. 49—55 **20 Claims**



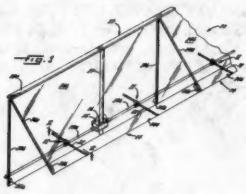
1. In security gate apparatus for securing an opening in a building and including fixed support means operatively associated with said building opening, security gate means supported from said support means and moveable relative thereto between a closed security gate means position wherein the same are operable to prevent entry to the building through the building opening, and an open security gate means position wherein the same are not so operable, and locking means operatively associated with said support means and said security gate means and operable to lock said security gate means in the closed position thereof, the improvements comprising, said locking means comprising a locking member which is generally vertically moveable between a first locking member position wherein the locking member is operable to lock said security gate means in the closed position thereof, and a second locking member position wherein the same is not so operable, locking member mounting means surrounding said locking member at least in part to deny access thereto, and locking member operating means operatively associated with said locking member and said locking member mounting means and operable to enable movement of said locking member from said first position thereof to said second position thereof, said locking member being operable when in the first position thereof to prevent movement of said security gate means into the closed position thereof, said locking member being operable to automatically move from said second position thereof to said first position thereof and remain therein to lock said security gate means upon movement of the latter into said closed position thereof.

4,630,397

DRUM AND CABLE MECHANISMS FOR OPENING/CLOSING GREENHOUSE VENT

George J. Dean, Jr.; Robert S. Klaeser, both of Arvada, and Lloyd W. Braa, Lakewood, all of Colo., assignors to Roper Corporation, Kankakee, Ill.

Filed May 28, 1985, Ser. No. 738,559
Int. Cl.[4] E05C *7/06*
U.S. Cl. 49—97 **23 Claims**



1. A control mechanism for opening and closing a window sash or like element pivotally mounted in a frame, said control mechanism comprising:
a drive shaft mounted for rotation about the longitudinal axis of said shaft;
means responsive to command signals for rotating said drive shaft in clockwise or counterclockwise rotation;
a drive member mounted on and coaxial with said drive shaft;
an elongated rod directly contacting at its central area the surface of said drive member such that clockwise and counterclockwise rotation of said drive shaft and said drive member causes reciprocal movement of said elongated rod along the longitudinal axis of said rod in directions transverse to the longitudinal axis of said drive shaft;
a housing member for maintaining said elongated rod in direct contact with said drive member such that said elongated rod and said housing member are free to rotate about the longitudinal axis of said drive shaft;
said elongated rod having a first end secured to said window sash such that longitudinal movement of said rod in a first direction in response to rotation of said drive shaft and said drive member results in the opening of said window sash and longitudinal movement of said rod in a second and reverse direction in response to rotation of said drive shaft and said drive member results in the closing of said window sash, with said housing member and rod in each case rotating about the axis of said drive shaft as the window sash pivots about said frame; and
said drive member including first, second and third cylindrical portions wherein each portion is annular in shape and wherein said first portion cradles said rod and said second and third portions are on opposite adjacent sides of said first portion for winding and unwinding cable means associated with said rod as an incident to rotation of said drive shaft and drive member.

4,630,398

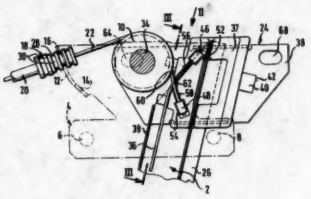
ARRANGEMENT FOR LIFTING AND LOWERING A WINDOWPANE, ESPECIALLY OF A MOTOR VEHICLE WINDOW

Gerhard Schust, Weidhausen, Fed. Rep. of Germany, assignor to Brose Fahrzeugteile GmbH, Coburg, Fed. Rep. of Germany

Filed May 31, 1984, Ser. No. 615,807
Claims priority, application Fed. Rep. of Germany, May 31, 1983, 8315959[U]
Int. Cl.[4] E05F *11/48*; B25G *3/00*; F16H *35/18*
U.S. Cl. 49—352 **2 Claims**

1. An installation for lifting and lowering a window, especially of a motor vehicle window, comprising a guide rail means, an entrainment means adjustable along said guide rail means for lifting and lowering the window, cable means ex-

tending approximately parallel to the guide rail means and having a shallow curvature with no sharp bends therein, ends of the cable means being secured on said entrainment means by squeeze nipples, the cable means have cable portions that cross over each other on their way to the squeeze nipples, longitudinal axes of the squeeze nipples extending at an obtuse angle to the cable means and coordinated thereto so as to cause little or no bending of the cable means as the entrainment means is adjusted along said guide rail means, the entrainment means including a plastic block-like member mounted on an entrainment plate provided with fastening means for attaching the entrainment plate to the window, apertures for the squeeze



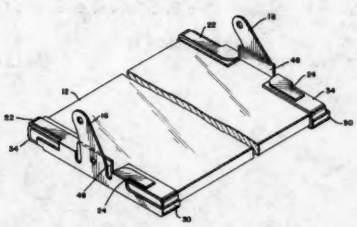
nipples and for the cable means being provided on a side of the plastic block-like member opposite the entrainment plate with one aperture means for the cable means being located further away from the fastening means than other aperture means for the cable means, the cable means crossingly extending out of the plastic block-like member on a side thereof opposite the guide rail means by way of rounded-off support surfaces of the cable apertures and subtending an obtuse angle, and a deflection roller arranged near the upper end of the guide rail means and laterally of the plastic block-like member for the cable means having apertures further away from the fastening means.

4,630,399

SECURITY CLIP FOR A LOUVER PANEL

Gordon Okumoto, 1849 Vancouver Pl., Honolulu, Hi. 96822

Filed Aug. 20, 1985, Ser. No. 767,421
Int. Cl.[4] E06B 7/08
U.S. Cl. 49—403 **16 Claims**



1. A louver panel assembly comprising:

(a) a generally planar louver panel having a longitudinal axis;

(b) mounting brackets attached to end portions of the louver panel for attaching the panel to a structure, each bracket defining a notch;

(c) a security clip member attached to the louver panel such that it extends substantially around the periphery of the louver panel between the mounting bracket and the louver panel; and,

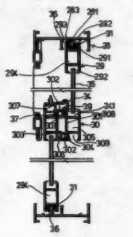
(d) first tab means on the security clip engaging the notch so as to prevent removal of the louver panel from the mounting brackets in a direction generally perpendicular to the longitudinal axis.

4,630,400

SASHES FOR A CLOSURE

Ming-Hung Hsieh, 179 Sec. 2, Chung Hua Rd., Tai Chung City, Taiwan

Filed Mar. 22, 1985, Ser. No. 715,099
Int. Cl.[4] E05D 13/00
U.S. Cl. 49—425 **14 Claims**



1. Sashes for a closure comprising an outer sash defining a window opening; a pair of relatively moveable, overlapping inner sashes mounted within said outer sash for opening and closing said window opening; said inner sash including a first upper rail, a first lower rail, a first left stile and a first right stile and being adapted to enclose therein a closure body; said outer sash including a second upper rail, a second lower rail, a second left stile and a second right stile and being adapted to be mounted on a wall of a building;

said second upper rail including a central vertical diaphragm plate for separating the cross-sectional area of said second upper rail into two equal parts;

said second lower rail including two parallel shallow socket channels;

the inner side of said second left stile having a protrusion;

said second right stile being identical to said second left stile in shape;

the cross-section of said first upper rail including a first end formed with a first receiving room for receiving and securing therein one side of said closure body and a second end having a third grooved channel positioned alongside said central vertical diaphragm plate and a fourth grooved channel near one side of said second upper rail;

the cross-section of said first lower rail being identical to that of said first upper rail and being disposed upside down and including a corresponding first end formed with a first receiving room for receiving and securing therein one side of said closure body and corresponding second end having a corresponding third grooved channel positioned alongside said outer side of one of said shallow socket channel and a corresponding fourth grooved channel capable of being positioned above the inner side;

said first left stile being a meeting stile and having a cross-section including a first end formed thereon a first receiving room for receiving and securing therein one side of said closure body and an L-shaped flange attached to the outer surface of said meeting side, near said first receiving room and having the vertical portion of the "L" section parallel to said outer surface to form therebetween a receiving space and a first grooved channel formed on said outer surface and near said second receiving room and a straight flange secured to the end edge of said first grooved channel and having a width extending to terminate on the meeting line;

the cross-section of said first right stile having a first end formed thereon a first receivng room for receiving and securing therein one side of said closure body and a second end formed thereon a second receiving room receiving therein a cushioning piece and the inner side of said second receiving room receiving said cushioning piece

having a second grooved channel receiving therein a sealing piece.

4,630,401

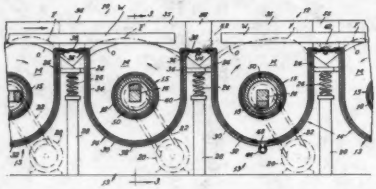
FINISHING MACHINE AND METHOD

Gary L. McNeil, Allegan, Mich., assignor to Roto-Finish Company, Inc., Kalamazoo, Mich.

Filed Dec. 11, 1984, Ser. No. 680,300

Int. Cl.[4] B24B *31/06, 1/00*

U.S. Cl. 51—7 **41 Claims**



1. A finishing machine having a finishing chamber for the vibratory surface-planing of an elongated part or workpiece, which is longer than the width of said chamber from side to side thereof, by feeding said elongated part to said machine from a direction normal to the side walls of the said finishing chamber thereof and in a direction parallel to the front and back walls of said chamber, which comprises

means for causing loose particulate finishing media to undergo vibration and orbital motion in said finishing chamber

said finishing chamber having upwardly-extending substantially vertical front and rear walls and

side walls, connected by an arcuate bottom between said side walls, and

an open top

to produce an orbit,

having an upper portion and a lower portion,

in a direction normal to said side walls of said finishing chamber and parallel to said front and rear walls of said chamber and in a direction corresponding to the longitudinal dimension of said part,

means for causing the upper portion of said orbit to extend vertically at least to the open top of said chamber, and

means for exposing the surface of the elongated part or workpiece to be finished to said orbiting finishing media without submergence in said media by positioning said surface in contact with said orbiting finishing media at the upper portion of its orbit.

4,630,402

APPARATUS FOR THE MANUFACTURE OR MACHINING OF STRAIGHT OR HELICALLY TOOTHED WORKPIECES

Manfred Erhardt, Puchheim; Herbert Loos, Dorfen-Stadt; Josef Lohrer, Munich; Udo Schapp, Wessling; Karl-Josef Schaeferling, Dillingen, and Walter Freundl, Eichenau, all of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

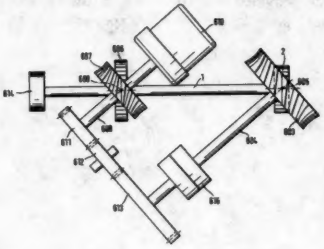
Filed Jan. 17, 1985, Ser. No. 692,437

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 3402724; Oct. 23, 1984, 3438741

Int. Cl.[4] B24B *19/00*

U.S. Cl. 51—105 GG **6 Claims**

1. In an apparatus for use in machining a tooth system of straight or helically toothed gears on a workpiece, said apparatus including a hyperboloidally or globoidally formed toothed tool having an abrasive surface on the teeth thereof and which has a sufficient axial dimension such that it meshingly engages said workpiece tooth system from one axially facing side thereof to the other and with normal backlash between the teeth thereof, first means defining a first crossed-axes angle relation between said workpiece and said tool, a first guide gear and first connecting means for coupling said first guide gear to said tool and being rotatable therewith, a second guide gear and second connecting means for coupling said second guide gear to said workpiece and being rotatable therewith, said first and second guide gears operatively engaging each other and having the same speed ratio as between said workpiece and said tool, said first and second guide gears operatively engaging each other and having normal backlash between the teeth thereof, and control means for controlling the relative positions between teeth on said workpiece and said tool and teeth on said first and second guide gears so that the operatively engaged combination of said workpiece/tool and said first guide gear/second guide gear is entirely backlash free, the improvement comprising wherein second means defines a second crossed-axes angle relation between said first guide gear and said second guide gear which, when meshingly engaged, is independent of said first crossed-axes angle relation.



4,630,403

METHOD AND MACHINE FOR GRINDING ROTATIONALLY SYMMETRICAL WORKPIECES

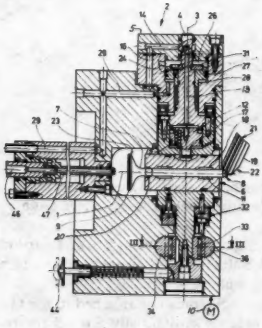
Heinz Belthle, Aichwald, Fed. Rep. of Germany, assignor to Schaudt Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 2, 1985, Ser. No. 783,193

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, 3437322

Int. Cl.[4] B24B *11/00*

U.S. Cl. 51—105 VG **8 Claims**



6. A machine for grinding axially spaced-apart first and second portions of rotary workpieces which are symmetrical with reference to their axes of rotation, such as the reciprocatory elements of lift valves, comprising a work holder; means

for rotating said holder about a first axis; a chuck having means for clamping a third portion of a workpiece, said holder having means for supporting said chuck for angular movement about a second axis which is inclined with reference to said first axis; means for inverting the chuck and the workpiece in the chuck with reference to said holder, including means for turning said chuck about said second axis; a rotary spindle; and a grinding wheel on said spindle, said grinding wheel having a working surface including circumferentially extending first and second sections and said turning means including means for moving the chuck between a first position in which the first section of the working surface can remove material from the first portion of the workpiece which is held by said chuck and a second position in which the second section of the working surface can remove material from the second portion of the workpiece which is held by said chuck.

4,630,404
APPARATUS FOR MANUFACTURING AND MACHINING GEARS

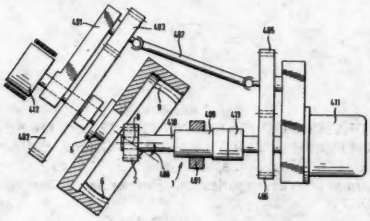
Manfred Erhardt, Puchheim, and Herbert Loos, Dorfen-Stadt, both of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Oct. 25, 1984, Ser. No. 664,812

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3345800

Int. Cl.[4] B24B *5/00*

U.S. Cl. 51—105 GG **4 Claims**



1. In an apparatus for the precision working of a tooth system of a rotatably supported gearlike workpiece by rolling the teeth of said gearlike workpiece with teeth on a rotatably supported gearlike tool, the axes of rotation of said workpiece and said tool being spaced along a common normal, said apparatus having a support means supporting said rotatably supported workpiece and tool for movement toward and away from each other in a direction parallel to said common normal and so that said axes of rotation thereof are crossed, guide gear train means with normal backlash therebetween coupled to and extending between said workpiece and said tool, said guide gear train means providing an effective speed ratio that is the same as between said workpiece and said tool, abrasive surface means on said teeth of said tool, said tool teeth being free of uniformly directed cutting edges, said tool further being formed hyperboliodially in the axial dimension thereof so that when said workpiece and said tool are engaged, at least one of said teeth of said tool is engaged by at least one of said teeth on said workpiece over the entire axial length of the tool tooth, first means providing a first tooth contact between successive teeth on said tool and successive teeth on said workpiece on only one side of each of said successive teeth on said tool, a backlash spacing being provided between each of said successive teeth on said workpiece and the opposite side of each of said successive teeth on said tool, second means for adjusting the relative position between said workpiece/tool and said guide gear train means so that the operatively engaged combination of said workpiece/tool and said guide gear train means is entirely backlash free, the improvement comprising wherein at least one of said tool and said workpiece is an internally toothed gear.

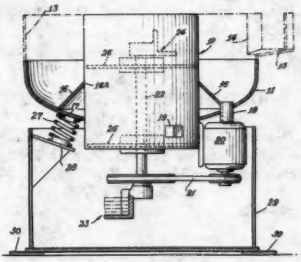
4,630,405
FINISHING CHAMBER AND FINISHING MACHINE COMPRISING THE SAME

Gary L. McNeil, Allegan, Mich., assignor to Roto-Finish Company, Inc., Kalamazoo, Mich.

Division of Ser. No. 706,143, Feb. 27, 1985. This application Dec. 16, 1985, Ser. No. 809,575

Int. Cl.[4] B24B *31/00*

U.S. Cl. 51—163.2 **5 Claims**



1. A structure suitable for use as at least a part of the finishing chamber of a vibratory finishing machine, comprising an essentially cylindrical tube comprising the center column of the finishing chamber,

an essentially circular tank head, having a bottom and an upwardly extending outer wall and a circumference selected so as to constitute the outer circumference of the chamber comprising the bottom portion of said chamber, with an essentially circular opening in the bottom thereof having a circumference corresponding to the circumference of said cylindrical tube,

said cylindrical tube being inserted through the essentially circular opening in said tank head and in circumferential contact therewith,

said cylindrical tube and said tank head being welded to secure them to each other at said point of contact.

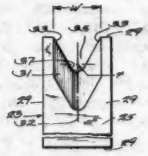
4,630,406
METHOD OF USING AN ELLIPTICAL FORM TO GENERATE A PERFECT RADIUS IN AN INSULATED ELECTRICAL CONDUCTOR STRIPPING BLADE

John D. Butler, New Berlin, Wis., assignor to Mechtrix Corporation, Wauwatosa, Wis.

Filed Sep. 20, 1984, Ser. No. 652,198

Int. Cl.[4] B24B *3/36*

U.S. Cl. 51—285 **3 Claims**



1. A method of manufacturing a blade for cutting and stripping insulation from an insulated electrical conductor, the blade having two faces and a predetermined curved surface connecting the two faces, the curved surface having a longitudinal axis at a predetermined angle to the faces and an elliptical contour symmetrical about the axis when viewed along the

axis, the cutting edge in the blank at the junction of the curved surface and one of the faces being circular when viewed perpendicular to the blade faces, comprising the steps of:

a. providing a blank generally shaped as a rectangular paralleopiped having two faces and exterior surfaces;

b. providing a grinding wheel;

c. dressing the periphery of the grinding wheel to a predetermined elliptical cross-section corresponding to the relationship between the desired radius of the blade circular cutting edge and the angle of the curved surface longitudinal axis with respect to the blank faces; and

d. feeding the grinding wheel through the blank at the predetermined angle to remove material from the blank to generate the predetermined curved surface connecting the two faces.

4,630,407

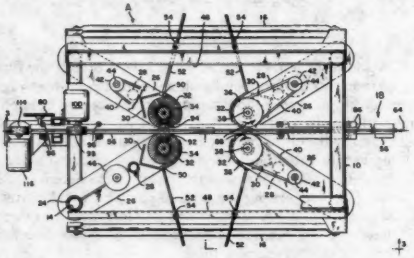
METHOD FOR FINISHING A THERMOPLASTIC COATING

Lynn R. Rhodes, 10706 231st St. SW., Edmonds, Wash. 98020

Continuation of Ser. No. 614,484, May 29, 1984, abandoned. This application Mar. 28, 1986, Ser. No. 846,466

Int. Cl.⁴ B24B *7/20*

U.S. Cl. 51—322 **8 Claims**



1. A method for finishing a substantially thermoplastic coating on an object, said coating of the type that dries by solvent evaporation, said method comprising:

contacting the coating with an abrasive containing brush, said brush raising the temperature of the coating to just about its thermoplastic temperature, speeding evaporation of said coating solvents; and

adjusting brush contact pressure and time to just that necessary to achieve said thermoplastic temperature of said coating such that said temperature is not substantially exceeded whereby the coating remains on said object but flows in response to said brush, during final solvent evaporation, and said coating solidifies to the final, uniform, smooth finish.

4,630,408

ROTARY FINISHING WHEEL

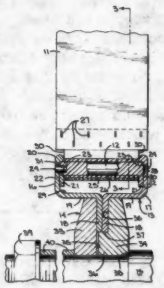
Joseph P. Iding, Wauwatosa, Wis., assignor to M. P. Iding Disc Grinding Compound Co., Inc., Milwaukee, Wis.

Continuation of Ser. No. 749,317, Jun. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,780, Sep. 4, 1984, abandoned. This application Feb. 7, 1986, Ser. No. 827,666

Int. Cl.⁴ B24D *13/04*

U.S. Cl. 51—337 **9 Claims**

1. In a finishing wheel, a pair of annular frame members each having an axially extending reach, a radially inward extending reach at one end of the axially extending reach and a radially outward extending reach at the other end of the axially extending reach, said pair of annular frame members comprising the only frame members and being disposed to place their respective radially inward extending reaches in axially adjacent relation to form an annular hub wherein the axial reaches of the respective frame members together with their radially outward reaches provide a single radially opening peripheral recess between the opposed outer reaches, a plurality of axially extending pin members spanning said hub recess and being supported solely by mounting directly to the radially outward



extending reaches, said pin members being equidistantly spaced relative to the wheel axis and in circumferential array, and a finishing pack mounted on each of the pin members, said annular hub being drivingly mountable on a rotateable shaft in service.

4,630,409

DEVICE FOR FINISHING THE EDGES OF SKIS

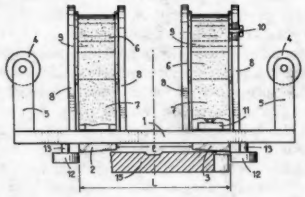
Michel Hofstetter, 3, Rue Eveche, 1204 Geneva, Switzerland

Filed Jul. 8, 1985, Ser. No. 752,649

Claims priority, application Switzerland, Dec. 9, 1982, 7159/82

Int. Cl.⁴ B24D *15/00*

U.S. Cl. 51—361 **3 Claims**

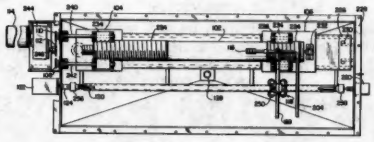


1. Device for finishing the edges of a ski, comprising a base plate adapted to be moved along the sliding surface of the ski, the base plate having on its lower face two blocks disposed on opposite sides of the device, said blocks having finishing surfaces thereon, lateral guiding members bearing in working position against the side faces of the edges of the ski, handles on the upper side of the base plate for moving the device lengthwise of the ski, the handles being transversely movable toward and away from each other and being connected with said lateral guiding members to move the lateral guiding members toward and away from each other with the handles, means resiliently urging the handles toward each other, and sliding plates one on each side of the device and mounted for sliding movement on said base plate, there being a said handle and a said lateral guiding member secured to each sliding plate.

4,630,410
REACTOR VESSEL STUD CLEANING MACHINE

David R. Cavada, Lower Burrell, and Leonard R. Golick, Levelgreen, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 6, 1983, Ser. No. 558,722
Int. Cl.[4] B24C 3/18
U.S. Cl. 51—410 25 Claims



1. A device for cleaning and decontaminating an elongate member having a three dimensional surface topography comprising:

an enclosure;

means for rotatingly supporting said elongate member proximate the ends thereof within said enclosure;

means for driving said elongate member supporting means, to rotate said elongate member; a supply tank for holding water

a spray nozzle connected to said supply tank and disposed within said enclosure operable to move transversely with respect to said elongate member for spraying a cleaning agent comprising high pressure water and abrasive grit against the rotating elongate member;

a self-contained means for supplying said cleaning agent to the spray nozzle and removing spent cleaning agent from the enclosure, said self-contained means including said supply tank and means for disposing of any contaminated solids in the spent cleaning agent, said means for disposing further comprising means for removing spent cleaning agent from said enclosure, means for removing solid particles from said spent cleaning agent and means for recycling water from said spent cleaning agent back to said spray nozzle; and

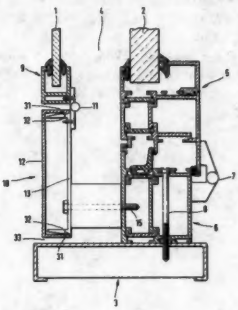
a control system for selectively controlling at least one of the rate of rotation of said elongate member and rate of traversal of said elongate member by said spray nozzle in accordance with the topography of said elongate member.

4,630,411
EXPLOSIVE ACTION INHIBITING GLAZING

Heinrich Sälzer, Industriestrasse 4, 3550 Marburg-Wehrda, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,444
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1983, 3327155; Jun. 5, 1984, 3420883
Int. Cl.[4] E04H 9/00; E06B 5/12
U.S. Cl. 52—1 3 Claims

1. An explosive action resistance glazing unit comprising an embrasure frame, an inner frame member mounted to said embrasure frame, an inner blast resistant pane mounted in said inner frame member, an outer frame member comprised of a glazing frame having an outer blast resistant pane mounted therein and a surrounding frame supporting said glazing frame, said surrounding frame having an inner section operatively connected to said embrasure frame and an outer section snap fitted connected to said inner section, said panes and frames together defining a space there between, pressure relief passage means extending into said space from the exterior in surrounding relation of said outer pane, said passage means being sized to permit the rapid outflow of gases within said space to thus minimize pressures within said space in response to an explosive inwardly directed force applied against said outer pane, said inner section having passages formed there through in communication with said space, whereby said outer section is released from said snap fitting connection with said inner

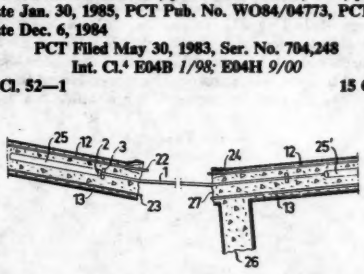


section to open said passages responsive to pressure build up in said space.

4,630,412
COLLAPSE PREVENTING CONNECTION DEVICE FOR BUILDING STRUCTURES

Björn M. H. Engström, Guldringen 27, S-421 52 Västra Frölunda, and Karl-Gustav Bernander, Ringvägen 32, S-133 00 Saltsjöbaden, both of Sweden

PCT No. PCT/SE83/00216, § 371 Date Jan. 30, 1985, § 102(e) Date Jan. 30, 1985, PCT Pub. No. WO84/04773, PCT Pub. Date Dec. 6, 1984
PCT Filed May 30, 1983, Ser. No. 704,248
Int. Cl.[4] E04B 1/98; E04H 9/00
U.S. Cl. 52—1 15 Claims



1. A tie device for building structures, adapted to connect structural elements and including at least one pull means having a first and a second end, and at least one anchoring means preferably adjacent to one of said ends, said anchoring means being surrounded by a cast material for connection to one of said structural elements, wherein said anchoring means (2,2') and said cast material (10) are so constituted that said anchoring means (2, 2') slides in said cast material when said pull means (1) is exposed to a tensional force that is less than its ultimate tensional strength and preferably greater than half its ultimate tensional strength, and wherein a stop means (3,3') is arranged in said cast material about said pull means in order to stop slippage after a predetermined slip distance by means of abutment of said anchoring means (2,2') against said stop means (3,3'), whereafter a higher tensional force than the slip force can be transmitted between said structural elements connected by said tie device.

4,630,413

POST FOR TRAFFIC SIGNS, LIGHTING AND THE LIKE

Lars Svensson, Vikingavägen 112, Vallentuna S-186 00, Sweden

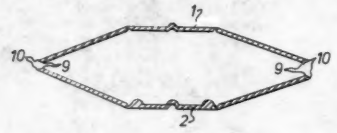
PCT No. PCT/SE84/00101, § 371 Date Dec. 4, 1984, § 102(e) Date Dec. 4, 1984, PCT Pub. No. WO84/04117, PCT Pub. Date Oct. 25, 1984

PCT Filed Mar. 21, 1984, Ser. No. 684,923

Claims priority, application Sweden, Apr. 8, 1983, 8301967

Int. Cl.[4] E01F *9/01*

U.S. Cl. 52—98 10 Claims



8. A support post deformable and collapsible upon impact by a motor vehicle, comprising

a plurality of essentially rigid generally planar metal sides joined along edges thereof to form a polygonal hollow profile;

folding means along the edges of said sides to provide folding, deformation and collapsing of said post along said edges upon impact by a motor vehicle, said folding means comprising connecting portions along said edges; and

means for effecting tearing along at least some of said connecting portions when subjected to extended deformation beyond a selected angle upon impact by a motor vehicle, said means comprising a groove (6) defining a thinned and weakened line along each said at least some connecting portions, said groove having two edges (9) and a groove bottom (10), the edges (9) of the groove coming into contact with one another upon said extended deformation and causing the groove bottom (10) to tear.

4,630,414

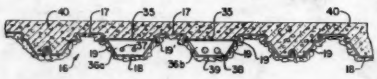
CELLULAR STEEL DECKING

Raymond M. L. Ting, 318 Holiday Dr., Pittsburgh, Pa. 15237

Continuation-in-part of Ser. No. 559,252, Dec. 8, 1983, abandoned, which is a continuation of Ser. No. 340,869, Jan. 20, 1982, abandoned, which is a continuation-in-part of Ser. No. 188,085, Sep. 17, 1980, abandoned. This application Jun. 7, 1985, Ser. No. 778,812

Int. Cl.[4] E04B *5/48*

U.S. Cl. 52—220 9 Claims



1. In a cellular flooring for a composite floor of a building comprising nestable corrugated steel decking stations connected in side-by-side arrangement, each of said sections comprising plural essentially imperforate horizontal crests and plural horizontal valleys connected by essentially imperforate generally sloping sidewalls whereby each pair of confronting sidewalls and the included one of said valleys defines a lengthwise trough, a covering layer of concrete compositively engaged with said decking sections to form said composite floor; the improvement comprising;

cover means comprising one or more strip elements secured to said decking section above the said included valley and below the said crests whereby an enclosed lengthwise cell is defined by said trough and said strip elements;

the said sloping sidewalls diverge from each said crest to the adjacent valleys and a reentrant groove is provided in each of said sloping sidewalls adjacent to the said crest; and the said strip elements are retained in position by engagement in a confronting pair of said grooves;

said covering layer of concrete extending into said reentrant grooves to form a composite bond above the said included valley;

at least one opening in said cover means defining a passageway which opens into said lengthwise cell.

4,630,415

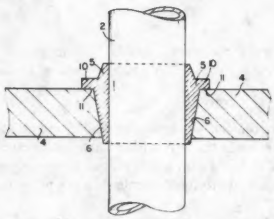
FIRE STOP

Ronald L. Attwell, Wicklow, Ireland, assignor to Selkirk Division of Household Manufacturing Limited, London, England

Filed Dec. 23, 1983, Ser. No. 564,877

Int. Cl.[4] E04B *5/48*

U.S. Cl. 52—221 15 Claims



1. A fire stop for sealing the space between a conduit and the periphery of an opening in a structural member through which the conduit passes, the fire stop comprising an annular collar of cementitioius material having a bore for sealable engagement with the conduit and an outer periphery, a major portion of the outer periphery of the collar being tapered in an axial direction to provide sealing engagement with the periphery of an opening.

4,630,416

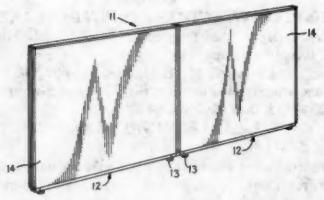
ACOUSTICAL PANEL

Daniel W. Lapins, Holland, and Richard Szymanski, Norton Shores, both of Mich., assignors to Haworth, Inc., Holland, Mich.

Filed May 9, 1985, Ser. No. 732,482

Int. Cl.[4] E04B *2/28*

U.S. Cl. 52—239 12 Claims



1. In an interior space dividing wall formed from a plurality of portable interior upright space-divider panels which are horizontally connected together in series, said panel having opposed enlarged side surfaces and a sound-absorbing core structure disposed between said side surfaces and extending substantially coextnesively over the area thereof, said core structure including first means for absorbing sound waves of one frequency and second means for absorbing sound waves of a substantially different frequency, said first means including a plurality of Helmholtz resonators each defined by a small substantially closed chamber disposed interiorly of the wall panel and communicating with the surrounding environment

through small opening means which project outwardly from the respective chamber toward one of the side surfaces of the panel, said first means including a thin sheetlike skin having said small opening means extending therethrough, and said second means including a layer of porous-sound-absorbing material overlying said plurality of Helmholtz resonators, said layer being of a porous fiberglass material, the improvement wherein said layer comprises:

a thin inner layerlike strata disposed so as to directly overlie said pluraltiy of Helmholtz resonators and said thin skin, said inner strata being of a high-density fiberglass material, and a thick outer layerlike strata disposed directly adjacent and coextensively overlying said inner strata, said outer strata being of a low-density fiberglass material, said outer strata having a density gradient which increases as it extends from its outer surface toward said inner strata, said outer strata consisting of a single integral layer having a variable density which progressively increases across the thickness thereof toward said inner strata, said outer strata having a thickness which is several times greater than the thickness of said inner strata, said inner strata having a density which is several times greater than the average density of said outer strata and which is also greater than the maximum density of said outer strata, and said inner strata having a maximum thickness of about 0.080 inch and a minimum density of about 6 pounds per cubic foot.

4,630,417

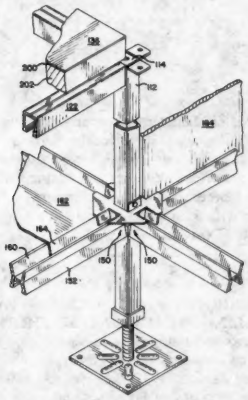
MODULAR COMBINATION FLOOR SUPPORT AND ELECTRICAL ISOLATION SYSTEM FOR USE IN BUILDING STRUCTURES

William R. Collier, 400 Park Blvd., Itasca, Ill.

Filed Feb. 13, 1984, Ser. No. 579,426

Int. Cl.⁴ E04B *2/82*

U.S. Cl. 52—263 **7 Claims**



1. A combination working area floor structure and conductor support and isolator assembly comprising, in combination, a plurality of vertically extending floor support column units each having upper and lower end portions and an intermediate column section, a working area floor positioned by and disposed in overlying relation to said upper ends of said column support units; means on at least one intermediate portion of said support columns for positioning and supporting at least one conductor support floor, said conductor support floor being disposed beneath and spaced apart from said working area floor, a plurality of vertically extending imperforate wall panel extending between portions of said conductor support floor and said working area floor so as to subdivide the region above said conductor support floor and below said working area floor into a mechanically isolated conductor plenum adapted to receive and support insulated electrical conductors, and to afford mechnical one upwardly extending opening in said working area floor through which said conductors may pass for attachment to an apparatus supported on said working area floor, with said wall panels also defining a mechanically isolated, vertically extending passage extending from beneath said conductor support floor through said isolated plenum and to said working area floor, with an under portion of said working area floor lying above said vertically extending passage and said conductor support floor also including at least one opening therein to afford communication between the area above said working area floor and the area beneath said conductor support floor.

4,630,418

APPARATUS OF CONSTRUCTION BY MEANS OF PREFABRICATED ELEMENTS, PARTICULARLY OF WOOD

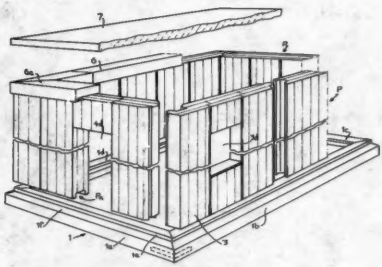
Andre Degut, Pomeys, France, assignor to Societe A. Degut, France

Filed Sep. 13, 1984, Ser. No. 650,355

Claims priority, application France, Sep. 20, 1983, 83 15372; Feb. 23, 1984, 84 03187

Int. Cl.⁴ F04B *1/10*; E04C *3/02, 3/30*

U.S. Cl. 52—264 **19 Claims**



1. In a building device particularly for building small houses, garages, shelters, doors and shutters, by means of a plurality of panels having transverse sides and lateral surfaces, the improvement which comprises in that each of said panels includes at least two vertical ridges bevelled in the vertical direction with a slanting profile at an angle 45° and formed from the same lateral surface, one of the transverse sides of said panel being provided along the entire length with a vertical groove which is formed at an angle of about 90° from the end of one of said ridges, the other transverse side of the panel being provided vertically along the entire length within the extension plane of the the other of said ridges with a rib parallel to said vertical groove and having a complementary contour.

4,630,419

BUILDING COMPONENTS

Thomas A. Pilgrim, Edwalton, England, assignor to BPB Industries Public Limited Company, London, England

Continuation of Ser. No. 373,676, Apr. 30, 1982, abandoned. This application Apr. 18, 1985, Ser. No. 724,464

Claims priority, application United Kingdom, May 1, 1981, 8113483

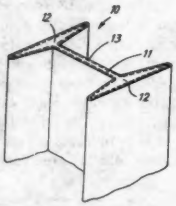
Int. Cl.⁴ E04C *3/30, 3/34, 2/06*

U.S. Cl. 52—309.13 **14 Claims**

1. A building component comprising:

an integral body of angulate, channel or hollow cross section, said body comprising a mixture of gypsum and resin; and

at least one sheet of inorganic fibres, each such sheet being embedded and completely surrounded in said body immediately below a surface thereof;

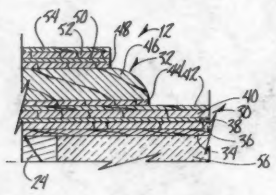


a continuous thin film of said gypsum and resin mixture of said body located on an exterior surface of said building component while being integral with said body and embedding and completely surrounding said sheet.

4,630,420
DOOR

Bruce A. Hagemeyer, Pella, Iowa, assignor to Rolscreen Company, Pella, Iowa

Filed May 13, 1985, Ser. No. 732,950
Int. Cl.[4] E06B 3/70
U.S. Cl. 52—313 **15 Claims**



1. A thermal and moisture resistant door, comprising:

a framework defining the perimeter edges of said door and defining the interior and exterior sides of said door, said framework including opposite elongated side frame members, a top frame member extending between said side frame members at the upper ends thereof, and a bottom frame member extending between said side frame members at the lower ends thereof;

a laminated skin secured to said framework on the interior and exterior sides of said door, said skin including an inner wood backer layer attached to said framework and having the wood grain running substantially parallel to the length of the door, a first wood cross-banding layer attached to said backer layer and having the wood grain running substantially perpendicular to the length of the door, a vapor barrier layer attached to said first cross-banding layer, a second wood cross-banding layer attached to said vapor barrier layer and having the wood grain running substantially perpendicular to the length of the door, and an outer wood veneer layer attached to said second cross-band layer and having the wood grain running substantially perpendicular to the length of the door;

a laminated panel secured to said skin on at least one side of said door, said panel including an inner first wood cross-banding layer attached to said veneer layer of said skin, an intermediate wood layer attached to said first cross-banding layer, a second wood cross-banding layer attached to said intermediate wood layer, a vapor barrier layer attached to said second cross-banding layer, a third wood cross-banding layer attached to said vapor barrier layer and an outer wood veneer layer attached to said third cross-banding layer, the wood grain of said intermediate layer and the wood grain of said veneer layer running substantially parallel to one another and the wood grain of at least one of said cross-banding layers running substantially perpendicular to the wood grain of said veneer layer;

wherein the layers of lamination of said skins provide strength to the door to prevent warping of the door due to temperature differentials across the door;

wherein the layers of lamination of said panel provide strength to the door and panel to prevent warping of the door and panel due to temperature differentials across the door and panel;

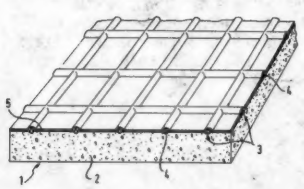
wherein said vapor barriers in said skins prevent warping of the door due to moisture absorption thereby; and

wherein said vapor barrier in said panel prevents warping of the panel due to moisture absorption thereby.

4,630,421
ROOF WEB FOR PITCHED ROOFS

Hermann Diehl, Mannheim; Günter Baatz, Buxheim, and Walter Machholz, Memmingen, all of Fed. Rep. of Germany, assignors to Metzeler Schaum GmbH, Memmingen, Fed. Rep. of Germany

Filed Nov. 29, 1985, Ser. No. 803,134
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443581; Oct. 30, 1985, 3538597
Int. Cl.[4] E04B 7/00
U.S. Cl. 52—408 **14 Claims**

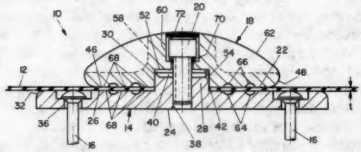


1. Roof web for pitched roofs, comprising a vapor diffusion permeable but surface water impermeable foil, a reinforcement disposed below said foil, and an open-pore soft foam material disposed below said reinforcement and connected to said foil through said reinforcement, said reinforcement being a tear-proof grid fabric with a diffusion equivalent air layer thickness of substantially 0.07–0.12 m.

4,630,422
PENETRATING ROOFING MECHANICAL FASTENING SEALING SYSTEM AND METHOD

Heinz W. Beneze, Richfield, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jan. 22, 1985, Ser. No. 693,550
The portion of the term of this patent subsequent to Nov. 4, 2003, has been disclaimed.
Int. Cl.[4] E04B 5/00, 1/38
U.S. Cl. 52—410 **19 Claims**



1. A penetrating, fastening and sealing device for both me-

chanically securing a flexible elastomeric sheet, of a range of thicknesses, to the upper surface of a roof, and sealingly engaging said sheet, said device comprising in combination:

(a) a rigid lower retainer including, on its upper surface a sharp annular edge for cutting an aperture of a first predetermined area and shape in the elastomeric sheet, said lower retainer having an area greater than said sheet aperture;

(b) means for anchoring said lower retainer to said roof upper surface;

(c) a rigid upper retainer, having an area greater than said sheet aperture area, adapted to overlie and completely cover said aperture, thereby confining a continuous peripheral portion of said sheet, bordering said sheet aperture, between said upper and lower retainers; and

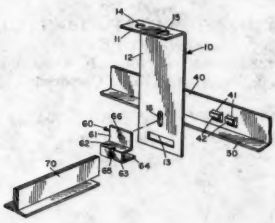
(d) separate fastener means engageable with a center portion of the upper retainer and extending from said upper retainer into a center portion of the lower retainer for drawing said retainers perpendicularly against each other to sealingly secure the elastomeric sheet between said retainers.

4,630,423

SUSPENDED-CEILING FRAMEWORK ASSEMBLY

Larry W. Lind, Spring Valley, Calif., assignor to United States Elevator Corporation, Spring Valley, Calif.

Filed Dec. 24, 1984, Ser. No. 686,002
Int. Cl.⁴ E04B 5/52
U.S. Cl. 52—484 **9 Claims**



8. A framework assembly for supporting ceiling panels, comprising:

a bracket comprising a flat, plate-like member having opposite flat faces and a support slot;

means for suspending the bracket vertically from an overhead support structure;

a first framing rail comprising an elongate flat web having at least one transverse flange for supporting the edge of a ceiling panel and hook means projecting transversely from the web for engagement through said support slot to support said rail to extend in a first horizontal direction with said web first against one of said flat faces of said bracket and said flange projecting beneath and across the lower edge of said bracket;

a retainer clip having an upper portion releasably secured to said bracket above said support slot on the opposite face of said bracket to said framing rail, the retainer clip having a first, outwardly projecting portion projecting away from said upper portion and a second, inwardly projecting portion projecting through said slot above said hook means to retain said hook means in said slot, the outwardly projecting portion having a cross rail retaining slot for locating a cross rail in a horizontal direction transverse to said first direction;

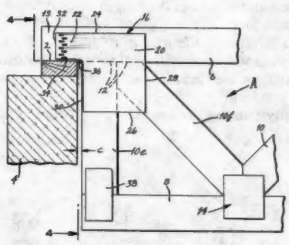
a cross rail having projecting means at one end for projecting into said cross rail retaining slot and acting between said retainer clip and framing rail flange to support said cross rail to extend in said transverse horizontal direction.

4,630,424

TOP HUNG TRUSS

George F. Eberle, St. Louis; Karl L. Bickel, O'Fallon, both of Mo., and John M. Denny, Renton, Wash., assignors to Lumbermate Company, St. Louis, Mo.

Filed Sep. 14, 1984, Ser. No. 651,041
Int. Cl.⁴ E04C 3/17, 3/292
U.S. Cl. 52—693 **11 Claims**



1. A truss comprising: a wood top chord having an upper surface; a wood bottom chord located below the top chord; wood webs extended between the top and bottom chords with at least some of the webs being oblique to the top and bottom chords so that the chords and webs transmit axial forces in the truss when a downwardly directed load is applied to the truss, the endmost of the webs being offset from the end of the top chord such that a portion of the top chord extends beyond the endmost web in the form of a chord extension at which an upwardly directed supporting force is exerted on the truss to resist the downwardly directed load, the endmost of the oblique webs being oriented such that the axial force transmitted by it intersects the axial force transmitted by the top chord below the upper surface of the top chord and near the inner end of the chord extension, so that the upwardly directed supporting force on the cord extension is offset from the location where the axial forces intersect, whereby shear forces exist at the chord extension and a bending moment develops generally about the inner end of the chord extension; and a metal connector plate joining the top chord and the endmost oblique web together and having an upper margin that is located below the upper surface of the top chord so that a portion of the top chord is exposed above the connector plate, the plate including a main section and a leg extended from the main section, the main section overlying the side faces of the top chord and the endmost oblique web and containing projections which are embedded in the top chord and endmost oblique web, the leg being formed integral with the main section and projecting from the main section such that the leg and main section form an inside corner in the connector plate, the leg overlying the chord extension and containing projections which are embedded in the chord extension, whereby shear forces and bending moments at the chord extension will be transmitted at least in part through the connector plate, the plate being configured and positioned such that the location at which the axial forces transmitted in the top chord and endmost oblique chord intersect is within the confines of the plate.

4,630,425

ERECTION MEANS FOR PORTABLE DRILLING SYSTEM

Lowell M. Reed, Oklahoma City, Okla., assignor to Parker Drilling Company, Tulsa, Okla.

Continuation of Ser. No. 649,929, Sep. 13, 1984, abandoned, which is a division of Ser. No. 261,902, May 8, 1981, Pat. No. 4,473,977. This application Nov. 19, 1985, Ser. No. 799,553
Int. Cl.⁴ B66C 27/06
U.S. Cl. 52—745 **1 Claim**

1. A method of erecting a drawworks structure having four pivoted legs and a mast on a subbase structure wherein the

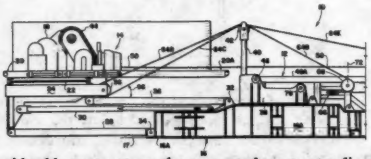
drawworks structure in the unerected position and the mast in the unerected position are of substantially the same elevational height, comprising the steps of:

(1) erecting a subbase on the earth's surface;

(2) erecting an upright sheave post on said subbase structure between an unerected drawworks structure and an unerected mast, the sheave post having a sheave at the upper end thereof, the height of the sheave post being greater than the elevational height of the unerected drawworks structure and less than the height of drawworks structure in erected form;

(3) pivotally pinning the four pivoted legs of the unerected drawworks structure to the subbase, the drawworks structure having a platform thereon with drawworks mounted on the platform;

(4) pivotally pinning the lower end of the unerected mast to



said subbase structure, the unerected mast extending horizontally away from said sheave post in the direction opposite said unerected drawworks structure;

(5) passing a line from said drawworks over said sheave post for connection to a pull point on said mast;

(6) using said drawworks to retract said line to pivot said drawworks structure upwardly into elevated, erected position above said subbase structure, the four legs of the drawworks platform extending vertically and adjacent to said sheave post; and

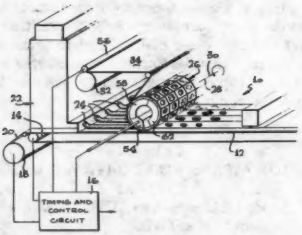
(7) connecting said line to said mast and continuing to reel in said line on said drawworks to pivot said mast to the upright position adjacent said drawworks structure and adjacent said sheave post, said sheave post remaining in upright position entirely between and independent of said drawworks platform and said mast for use in diserecting said mast and drawworks structure.

4,630,426

FOOD UNIT MAKING AND PACKAGING APPARATUS AND METHOD

James C. Gentry, 21461 Encina Rd., Topanga, Calif. 90290

Filed May 17, 1985, Ser. No. 735,047
Int. Cl.[4] B65B *9/02*
U.S. Cl. 53—428 **10 Claims**



9. A food unit making and packaging method comprising the steps of:

advancing an indentable conveyor belt;

laying a base layer of packaging film upon the conveyor belt;

laying a continuous strand of moldable material on the conveyor belt as it advances;

positioning a portion-forming wheel having edges around portion cavities therein with ramped press areas within the edges and around the portion-forming cavities, with the portion-forming cavities around the periphery of the portion-forming wheel and sufficiently close to the conveyor belt to rotate and indent the conveyor belt as the conveyor belt advances;

laying a layer of cover packaging film on the portion-forming wheel to cover the portion cavities therein; and

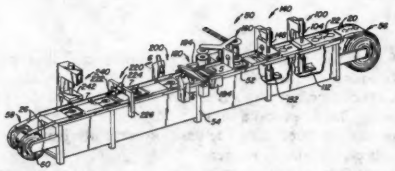
forming units of moldable material by cutting the strand of moldable material by the portion-forming wheel between the cavities and forcing the moldable material into the cavities by the edges and ramped press areas indenting the conveyor belt to form separate portion cavities so that the moldable material is cut into units, shaped by the shape of the portion cavities, and packaged between the films.

4,630,427

METHOD AND SYSTEM FOR FOLDING FLOPPY DISK ENVELOPES

Bruce Harper, San Jose, and Horace N. Kemp, Walnut Creek, both of Calif., assignors to Xidex Corporation, Santa Clara, Calif.

Filed May 15, 1985, Ser. No. 734,621
Int. Cl.[4] B65B *11/48*
U.S. Cl. 53—460 **8 Claims**



1. A method for folding flopping disk envelopes, said method comprising:

feeding a continuous web of envelope material along a predetermined path, said web including a plurality or partially-cut envelope blanks which comprise a primary flap joined to a secondary flap along a common edge transverse to said path and three sealing flaps joined to the other three edges of the primary flap;

folding at a first location on the path the secondary flap over against the primary flap along a fold line transverse to the path to form the envelope while the primary flaps of the folded blank and the upstream and downstream envelope blanks remain attached at their corners to bhe web;

folding and sealing at a second location on the path at least two of the sealing flaps over against the secondary flap along fold lines parallel to the path to seal those edges of the envelope while said primary flaps remain attached to said web; and

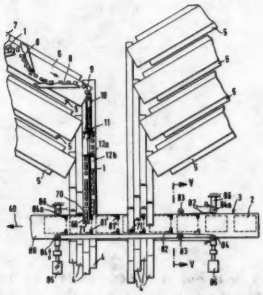
detaching the folded, sealed envelope from the web at a third location along the path.

4,630,428

METHOD AND APPARATUS FOR PLACEMENT OF SMALL ARTICLES, SUCH AS CANDIES OR CHOCOLATES IN PREDETERMINED POSITIONS IN A RECEIVER

Hans-Bernd Lesch, Munich, Fed. Rep. of Germany, assignor to Sapal Societe Anonyme des Plieuses Automatiques, Ecublens, Switzerland

Filed Apr. 2, 1985, Ser. No. 718,862
Claims priority, application European Pat. Off., Apr. 28, 1984, 84104796
Int. Cl.[4] B65B *59/00*
U.S. Cl. 53—474 17 Claims



1. Method of placing small articles (1), such as candies, chocolates and the like, in a predetermined position in a receiver (2) having receiving compartments for the articles,

using the steps of

allocating to each article a coordinate position (90) in the receiver (2) in an orthogonal X-Y coordinate system (89);

continuously transporting the receiver (2) in the X coordinate direction, with a predetermined speed and a predetermined spacing, beneath an insertion station;

supplying the articles to the insertion station;

at the insertion station, grasping an article and cyclically moving the grasped article in a predetermined insertion path (47) in the Y coordinate direction, over the continuously moving receiver,

releasing the grasped article into the receiver (2),

and controlling

the X coordinate position of placement or the articles in the receiver during the continuous transport movement of the receiver by selectively controlling the timing of the insertion movement of the articles during said continuous transport movement of the receiver with respect to the continuous transport movement of the receiver (2) to thereby determine, during the continuous transport movement of the receiver, the selected X coordinate position (90) of the article (1) in the receiver upon release of the article into the receiver; and

the step of cyclically moving the articles in the predetermined insertion path (47) comprises moving the articles in a path which is located in a vertical plane, which plane includes said Y coordinate direction,

and is fixed in space; and

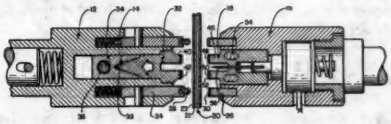
the receiver is moving at a constant speed past the insertion station.

4,630,429

APPARATUS AND METHOD FOR SEALING A WEB OF FILM IN A FORM, FILL, AND SEAL PACKAGING SYSTEM

William C. Christine, Catasauqua, Pa., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 1, 1985, Ser. No. 697,556
Int. Cl.[4] B65B *9/00*
U.S. Cl. 53—479 46 Claims



6. In a machine for manufacturing from a web of film a closed flexible bag having transverse seals an apparatus for creating the transverse seals comprising:

heating means, including a hot bar with at least one film contact surface and means for heating the hot bar, for melting a portion of the web of film to create the transverse seals;

cooling means for cooling the heating means and the melted portion of the web of film, the cooling means being located diametric the heating means and including a cold bar with at least one film contact surface and means for cooling the cold bar;

a pair of jaws, the heating means being located in a first of the jaws and the cooling means being located in a second of the jaws; and

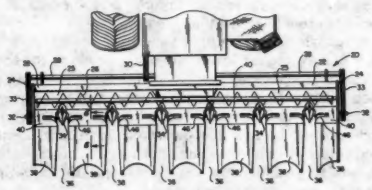
the heating means includes means for disengaging the means for heating the hot bar from the hot bar as the jaws contact the web of film.

4,630,430

CORN HEAD ASSEMBLY FOR HARVESTING CORN

Harry D. Weeks, 7225 Kile Rd., Plain City, Ohio 43064

Filed Apr. 10, 1985, Ser. No. 721,684
Int. Cl.[4] A01D *45/02*
U.S. Cl. 56—14.1 4 Claims



1. In a corn head assembly for mounting on the forward end of a conventional self-propelled combine and shelling apparatus; the combination of a frame means supporting a corn ear collecting means; a plurality of forward extending guide members laterally spaced from one another relative to the normal direction of travel to define a plurality of corn stalk-receiving openings; a corn stalk distributing means disposed at or near the rearward end of each of said corn stalk-receiving openings and including a rotatably mounted disk-like member provided with a vertially disposed knife-like outer edge and pair of curved surfaces extending laterally in opposing directions from said outer edge for engaging and imparting lateral movement to a corn stalk passing through said corn stalk-receiving openings; a stripping plate means disposed adjacent to each side of distributing means and including a longitudinal slot means having an open end facing said distributing means and aligned

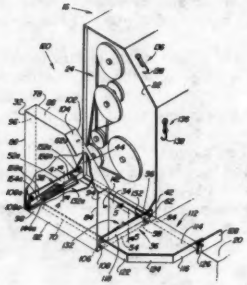
to receive a corn stalk laterally directed by said distributing means and having a width insufficient to permit a corn ear from passing through said slot means, and a pair of closely spaced, snapping rolls rotatably driven in opposing directions relative to one another and mounted on said frame means below a respective one of said slot means and adjacent to a respective one of said distributing means to engagably receive a corn stalk directed by said distributing means between said rolls and force said stalk downwardly through said slot means; the axis of rotation of said rolls being generally parallel to the longitudinal extent of said slot means and disposed at generally a right angle to the normal direction of travel of said apparatus.

4,630,431

COMBINATION PLATFORM AND SHIELD FOR AN IMPLEMENT

Francis E. Schlueter, Des Moines, and Joel M. Schreiner, Ankeny, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Oct. 31, 1985, Ser. No. 793,605
Int. Cl.[4] A01D *46/08*; B62J *13/06*
U.S. Cl. 56—28 **21 Claims**



1. In an implement having upright structure supporting operable elements during operation, movable shield structure comprising:

linkage structure rockably connected to the implement adjacent the lower portion of the upright supporting structure and movable between an upright position and an outwardly extending position;

an upright shield having upper and lower ends; and

means connecting the lower end of the shield to the linkage structure for rocking therewith between a shielding position adjacent the operable elements and an access position offset from the elements as the linkage structure moves between the upright and outwardly extending positions, respectively, wherein said linkage structure includes means for maintaining the shield upright in both the shielding and access positions.

4,630,432

PICK-UP TINE ASSEMBLY FOR HARVESTER REELS

John E. Love; Archie E. Neal, both of Garfield, and Scott Libby, Spokane, all of Wash., assignors to J. E. Love Company, Garfield, Wash.

Filed Mar. 21, 1985, Ser. No. 714,624
Int. Cl.[4] A01D *57/02*
U.S. Cl. 56—220 **11 Claims**

1. A harvester bat and pick-up tine combination, comprising:

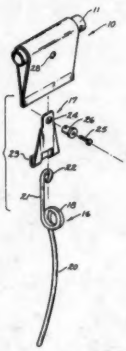
an elongated bat having front and rear walls extending between top and bottom edges of the bat; and

a plurality of individual tine assemblies individually releasably mounted to the bat, with each individual tine assembly including:

a wire tine in the form of a coil wound about a central coil axis and having a downwardly extending finger leading from one side and an upwardly extending shank leading from its remaining side, said shank terminating in a closed transverse loop;

a bracket covering the shank of the tine and overlying the rear wall of the bat, said bracket including an apertured upper end centered on the closed transverse loop of the tine shank;

releasable fastening means extending through the closed transverse loop of the tine shank and the rear wall of the bat for clamping the upper end of the bracket and tine shank against the bat;



said bracket including a lower hooked lip releasably received over the bottom edge of the bat and extending longitudinally along the lower bat edge to releasably secure the bracket to the bat in cooperation with the fastening means; and

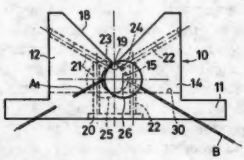
retaining means on the bracket and engaging the tine for preventing motion of the tine shank in the plane of the rear bat wall, the retaining means including an opening in said bracket in which the coil of the tine is located with the coil axis coplanar with the bottom edge of the bat.

4,630,433

METHOD FOR THE SPLICING OF TEXTILE THREADS BY MEANS OF A COMPRESSED GAS, AND SPLICING DEVICE FOR THE ACCOMPLISHMENT OF THE METHOD

Mauro Premi, Salo, Italy, assignor to Mesdan S.p.A., Salo, Italy

Filed Nov. 8, 1985, Ser. No. 796,436
Claims priority, application Italy, Nov. 12, 1984, 23530 A/84
Int. Cl.[4] D01H *15/00*
U.S. Cl. 57—22 **10 Claims**



1. A method for the splicing of two textile threads by means of a compressed gas which comprises the steps of inserting the two threads to be joined through a longitudinal slit into a splicing chamber having a longitudinal axis and provided in a head having two opposite parallel side walls perpendicular to the longitudinal axis of the chamber, in correspondence of which walls there are side outlet openings of the same cham-

ber, and subjecting the lengths of threads enclosed within the chamber to at least one burst of compressed gas blown into the inside of the chamber, characterized in that before the introduction of the compressed gas into the splicing chamber, the side outlet openings are substantially closed, in that at the same time the threads entering the chamber are locked against the respective side walls of the head, and in that the cut tails of the threads extending out of the side outlet openings are left free and unlocked, and in that the compressed gas blown into the chamber escapes from the same mostly through at least one port provided in the head transversely to the longitudinal axis of the chamber.

4,630,434

ROVING BLOCKING MECHANISM ON DRAW FRAMES OF SPINNING MACHINES

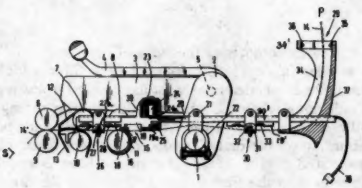
Max Hartmannsgruber, Kirchheim; Michael von Ronai-Horvath, Ludwigsburg; Kurt Seebo, Esslingen, and Bernhard Schoenung, Filderstadt, all of Fed. Rep. of Germany, assignors to SKF Textilmaschinen-Komponenten GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 23, 1985, Ser. No. 693,961

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1984, 3406397

Int. Cl.[4] D01H *13/16, 13/18*

U.S. Cl. 57—87 10 Claims



1. A draw frame for a spinning machine adapted to convert a roving supplied from an external source into a thread, comprising aligned pairs of inlet rollers and drafting rollers through which said roving travels from said external source, sensing means for detecting the continuity of the roving as supplied to said inlet rollers from said external source, blocking means associated with said inlet rollers selectively actuable to arrest the movement of said roving through said inlet rollers, clamp means selectively actuable, to arrest the travel of said roving, said clamp means being located along the path of travel of said roving between said sensing means and said blocking means at said inlet rollers and roving support means located between said inlet rollers and said drafting rollers, and means responsive to the sensing by said sensing means of a breakage in said roving supplied from said external source for simultaneously activating said blocking means and said clamp means to arrest said roving, said clamp means, blocking means and support means being aligned along the path of travel of said roving so as to maintain said arrested roving along the path of travel in alignment with said paired inlet and drafting rollers and the end of said arrested roving in position for re-combination with the roving from said external source.

10. A draw frame for a spinning machine adapted to convert a single roving supplied from an external source into a thread, comprising upper and lower paired inlet rollers and drafting rollers through which said roving travels from said external source, blocking means associated with said inlet rollers selectively actuable to arrest the movement of said roving at said inlet rollers, clamp means actuable for holding said roving located upstream along the path of travel of said roving and guide means for directing said roving from said external source to said clamp means and sensing means located upstream of said clamp means responsive to the sensing of a breakage in said roving supplied from said external source for activating both said blocking means and said clamp means simultaneously to arrest said roving to thereby hold one end of said arrested roving at said inlet rollers and the other end of said arrested roving in the path of travel from said external source.

4,630,435

SYSTEM FOR AUTOMATICALLY CHANGING SPOOLS OF A SPINNING MACHINE

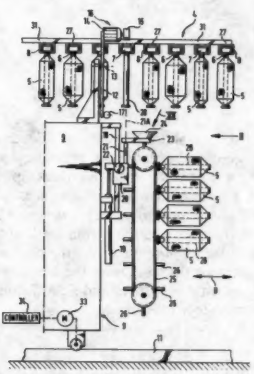
Wolfgang Igel, Ebersbach, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 595,992, Apr. 2, 1984, abandoned. This application Jun. 27, 1985, Ser. No. 749,870

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312116

Int. Cl.[4] D01H *9/02, 9/10, 9/18*

U.S. Cl. 57—281 8 Claims



1. A spinning system comprising:

a spinning apparatus having a longitudinal succession of spinning stations;

a creel extending longitudinally above the apparatus and having respective pendant hangers above the stations and each capable of holding a respective yarn package;

a respective slide above each station supporting the respective hanger slidable between an inner position directly above the respective station and an outer position above but horizontally offset therefrom;

a reloading apparatus displaceable longitudinally along the apparatus at least generally under the hangers in the outer positions of the respective slides;

a magazine holding a supply of fresh roving packages on the reloading apparatus;

means on the reloading apparatus for displacing the slide between the inner and outer positions; and

means on the reloading apparatus for grabbing the package on the hanger in the outer position of the slide.

4,630,436

AIR STORAGE GAS TURBINE POWER STATION WITH FLUIDIZED BED FIRING

Hansulrich Frutschi, Riniken, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 11, 1985, Ser. No. 753,913

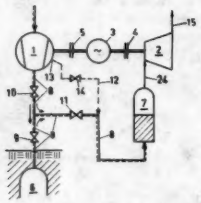
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1984, 3428041

Int. Cl.[4] F02C *3/26*

U.S. Cl. 60—39.183 3 Claims

1. An air storage gas turbine power station with fluidized bed firing whose gas turbine group comprises a turbine, a compressor, an electrical machine which can be operated alternatively as a generator and an electric motor, a first clutch

between the turbine and the electrical machine, a second clutch between the electrical machine and the compressor, an air storage chamber, a coal-fired fluidized bed combustion chamber, a combustion gas duct which communicates the fluidized bed combustion chamber with the turbine, a main air duct; and which communicates an outlet of the compressor with the air storage chamber and communicates both the air storage chamber and the outlet of the compressor with the fluidized bed combustion chamber, a first shut-off valve for selectively shutting-off the outlet of the compressor from said



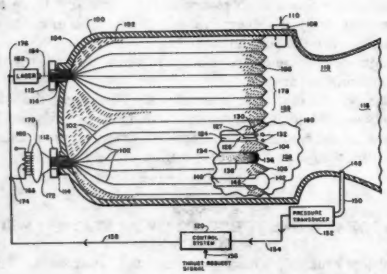
main air duct, a second shut-off valve for selectively shutting-off the air storage chamber from the main air duct, a throttle unit at a location along the main air duct upstream of the fluidized bed combustion chamber and a separator cyclone at a location along the combustion gas duct between the fluidized bed combustion chamber and the turbine, a low load air duct which communicates tapping means on the compressor with a section of the main air duct between the throttle unit and the fluidized bed combustion chamber and a third shut-off valve at a location along the low load air duct.

4,630,437

OPTICAL CONTROL METHOD FOR SOLID FUEL ROCKET BURN RATE

Peter C. Winch, Elizabeth East, Australia, and Mick Blackledge, Lancaster, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 696,298, Jan. 29, 1985, Pat. No. 4,587,805. This application Nov. 25, 1985, Ser. No. 801,362
Int. Cl.[4] F02K 9/26
U.S. Cl. 60—204 **11 Claims**



1. A method for generating controlled thrust from a solid fuel grain rocket motor comprising the steps of:

igniting the rocket fuel at a grain face burn surface:

sensing the achieved burn rate of the fuel grain, generating thereby a burn rate representive signal;

preheating a plurality of grain regions located across the grain body preceding the progressing burn surface with externally supplied optical energy; and

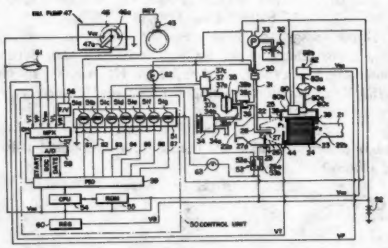
modulating the rate of said preheating in response to the difference between a thrust control signal and said burn rate representative signal.

4,630,438

EXHAUST PARTICLE REMOVING SYSTEM FOR AN ENGINE

Motohiro Shinzawa, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 6, 1985, Ser. No. 773,193
Claims priority, application Japan, Sep. 12, 1984, 59-189488
Int. Cl.[4] F01N 3/02
U.S. Cl. 60—274 **5 Claims**



4. A method comprising the steps of:

(a) measuring degree of clogging of a filter which traps particles suspended in exhaust gas emitted from an engine;

(b) indicating when the measured degree of clogging of the filter is equal to or greater than a first reference level;

(c) burning off the particles deposited on the filter when the measured degree of clogging of the filter is equal to or greater than the first reference level and when a manual switch is in a preset position; and

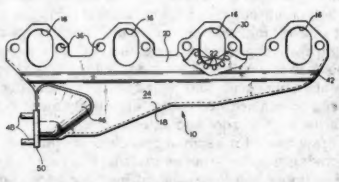
(d) burning off the particles deposited on the filter independent of whether or not the manual switch is in the preset position when the measured degree of clogging of the filter is equal to or greater than a second reference level greater than the first reference level.

4,630,439

EXHAUST GAS AFTERBURNER

Sharon J. Hudson, Jr., Lambertville, Mich., assignor to Sharon Manufacturing Company, Lambertville, Mich.

Filed Jun. 3, 1985, Ser. No. 740,580
Int. Cl.[4] F01N 3/30
U.S. Cl. 60—305 **20 Claims**

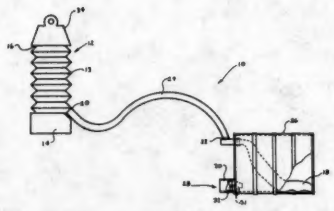


1. An exhaust gas afterburner device adapted for installation between an exhaust manifold and a corresponding portion of the engine block of an internal combustion engine, said device comprising: a spacer sandwiched between portions of two sheet metal members forming a gasket section of said device, said gasket section surrounding at least one exhaust gas port, a plenum section formed by remaining portions of said members, wall sections defining a plurality of passageways extending from the interior of said plenum section to said port and an air supply inlet on said plenum.

4,630,440
PROCESS AND APPARATUS FOR GENERATING ELECTRICAL POWER FROM OCEAN WAVES

Mary E. Meyerand, 64 Littel Acres Rd., Glastonbury, Conn. 06033

Filed Nov. 21, 1985, Ser. No. 800,279
Int. Cl.[4] F03B *13/12*
U.S. Cl. 60—398 15 Claims



1. An apparatus for generating electrical power from ocean waves comprising:

first housing means adapted for submersion at a selected depth beneath the ocean waves, said first housing means including at least one opening therethrough;

first flexible bladder means, said first bladder means being disposed within said first housing means;

electrical generating means being associated with said first housing means opening whereby ocean water flowing through said opening will actuate said electrical generating means;

constant pressure reservoir means adapted for positioning above said ocean waves;

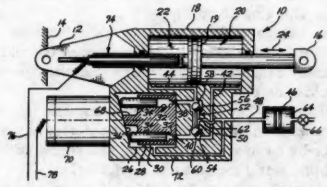
conduit means communicating between said first flexible bladder means and said constant pressure reservoir means; and

a fixed quantity of fluid being disposed within said first bladder means, said constant pressure reservoir means and said conduit means.

4,630,441
ELECTROHYDRAULIC ACTUATOR FOR AIRCRAFT CONTROL SURFACES

Theron R. Chamberlain, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 4, 1984, Ser. No. 646,755
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—413 12 Claims



1. An improved electrohydraulic actuator for use aboard an aircraft, said actuator being of a type including a balanced, double-acting hydraulic ram connectable between a support and a member to be moved relative to said support, such ram having a cylinder and a movable piston received within the cylinder, said piston dividing the cylinder into first and second chambers, one on each side of said piston, said actuator further comprising:

a fixed displacement pump, the operative rotation of which is reversible, and having a pair of ports, said pump being characterized in that one of said ports acts as a pump outlet and the other of said ports acts as a pump inlet, and vice versa, depending on the direction of rotation of said pump, wherein said port acting as an outlet outputs hydraulic fluid at a certain outlet pressure;

a reversible variable drive electric motor drivingly connected to said pump;

a first conduit unobstructedly connecting one of said pump ports to one of said cylinder chambers, for providing an uninterrupted fluid flow path between said one port and said one chamber;

a second conduit unobstructedly connecting the other of said pump ports to the other of said cylinder chambers, for providing an uninterrupted fluid flow path between said other port and said other chamber;

a third conduit interconnecting said first and second conduits;

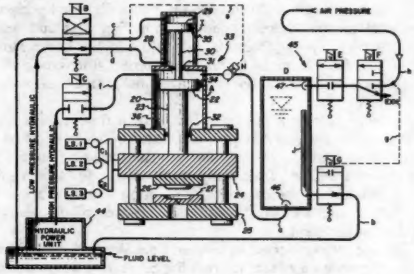
an accumulator means, connected to said third conduit, for delivering pressurized hydraulic fluid thereto, at a pressure less than said pump outlet pressure; and

valve means, positioned in said third conduit, for blocking pump outlet flow in one of said first and second conduits from flowing into the other of said first and second conduits, and for at the same time permitting hydraulic fluid flow from said accumulator means to be communicated into said other conduit.

4,630,442
APPARATUS AND METHOD FOR PRE-FILLING A HYDRAULIC MOTOR

Peter C. Massaro, Syracuse, and Ronald F. Legawiec, E. Syracuse, both of N.Y., assignors to Trol-Mation, Inc., Syracuse, N.Y.

Filed Jun. 18, 1984, Ser. No. 621,563
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—415 21 Claims



1. In a hydraulic press of the type having a hydraulic power unit with a hydraulic fluid tank and an independent means for advancing and retracting the piston of a hydraulic motor, a hydraulic fluid pre-fill system comprised of:

a reservoir for holding a supply of hydraulic fluid for use in pre-filling the hydraulic motor, said reservoir having a gas inlet for connection to a compressed gas source, a pre-fill fluid port connected to the power input side of the hydraulic motor and a hydraulic fluid drain outlet for discharging excess volume hydraulic fluid; and

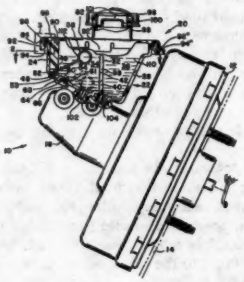
control means connected in the gas inlet, the hydraulic fluid drain outlet and the pre-fill fluid port for causing hydraulic fluid to be transmitted from the reservoir to the hydraulic motor under pressure from the compressed gas source as the piston is advanced, and for allowing hydraulic fluid to be discharged from the motor to the reservoir as the piston is retracted with any excess fluid being discharged from the reservoir under compressed gas pressure through the hydraulic fluid drain outlet.

4,630,443

RESERVOIR FOR A MASTER CYLINDER

John E. Steer, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Jan. 3, 1985, Ser. No. 740,668
Int. Cl.[4] F15B 7/00
U.S. Cl. 60—535 3 Claims



1. A reservoir for a master cylinder of a brake system, said reservoir consisting of:

a body having side walls connected to a base member, said body having an interior wall that separates a first compartment from a second compartment, said interior wall having an opening located a fixed distance from said base to permit communication of fluid between said first and second compartments while assuring a minimum volume of fluid is retained in each of said first and second compartments, said base member having first and second ports therein for connecting said first and second compartments with first and second chambers within said master cylinder, said side walls having a flange with a first peripheral lip located thereon, said body having first and second arms extending from one side into said first compartment, said base member having an external slot with a corresponding internal flat surface located in said first compartment;

a lever having a pin on a first end, a float attached to a second end and a magnet positioned between said first and second ends, said pin being attached to said first and second arms, said float being responsive to the level of fluid in said first compartment by pivoting said lever about said first end and positioning said magnet within said first compartment;

sensor means located in said external slot and responsive to the position of said magnet for generating a signal indicative of the fluid level in said first compartment;

an end member having a vent tube extending therefrom, said end member having a second peripheral lip with a corresponding shoulder located adjacent thereto to define a groove, said end member having a projection extending from said shoulder into said first compartment, said projection having an end surface that assures that said pin is retained in said first and second arms on movement of said lever by said float;

a seal resiliently retained on said shoulder in said groove on said end member;

a cap connected to said vent tube through which fluid is supplied to said first and second compartments; and

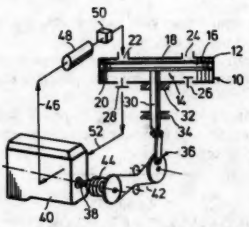
a plurality of tangs extending from said second peripheral lip on said end member, said tangs initially radially expanding to allow said first peripheral lip to be located in said groove and when said shoulder engages said flange to radially contract and lock said end member to said body, said shoulder and flange first forming a first mechanical barrier and the compression of said seal between said shoulder and first peripheral lip forming a second mechanical barrier to retain fluid in said first and second compartments, said base member being located in a plane that forms an acute angle with said end member, said float following the level of fluid in first and second chambers and when the float is below the opening in said interior wall, positioning said magnet with respect to said flat surface to provide said sensor means with a signal indicative of the fluid level in said first compartment.

4,630,444

INTERNAL COMBUSTION ENGINE WITH A COMBINATION EXHAUST AND DIRECT DRIVE SUPERCHARGER

Oskar Schatz, Tellhohe 14, D-8031 Stockdorf, Fed. Rep. of Germany

Filed May 14, 1984, Ser. No. 609,957
Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318093; May 18, 1983, 3318162
Int. Cl.[4] F02B 37/10
U.S. Cl. 60—598 4 Claims



1. A combination supercharger and exhaust driven motor for an internal combustion engine comprising:

a housing defining a chamber,

a piston disposed in said chamber for movement therein and separating said chamber into an exhaust gas chamber and an air charging chamber,

first conduit means for connecting said exhaust gas chamber with the exhaust port of a cylinder of said engine, whereby exhaust gas pulses urge said piston toward said air charging chamber,

second conduit means for connecting said air charging chamber with the intake port of a cylinder of said engine, whereby air in said air charging chamber compressed by said piston is directed to said cylinder,

a drive train causing reciprocation of said piston in a predetermined phase relationship with the rotation of the crankshaft of said engine whereby both said exhaust gas and said drive train are able to transmit energy to said piston to thereby compress air in said air charging chamber which is transmitted to said cylinder and whereby when said exhaust gas energy exceeds the magnitude needed to compress said air in said air charging chamber, a portion of said exhaust gas energy is transmitted by said engine through said piston and said drive train, and means for changing said phase relationship between said piston and said engine crankshaft.

4,630,445

WASTEGATE VALVE FOR INTERNAL COMBUSTION ENGINE TURBOCHARGER

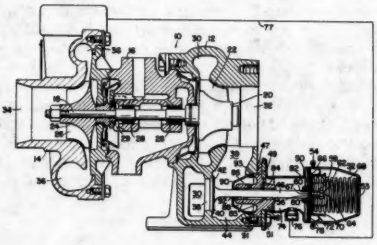
John Parker, Huddersfield, England, assignor to Holset Engineering Company Limited, Turnbridge, England

Filed Mar. 15, 1985, Ser. No. 712,950

Claims priority, application United Kingdom, Mar. 16, 1984, 8406859

Int. Cl.[4] F02B *37/00*

U.S. Cl. 60—602 6 Claims



1. A wastegate valve assembly for a turbine mounted for rotation within a turbocharger housing having an inlet passage for delivering hot exhaust gases to said turbine, said valve assembly comprising:

means for defining an exhaust gas flow path around said turbine, said flow path means including a valve seat;

a valve head carried by a valve stem;

a valve guide means slideably mounting said valve stem for movement between two positions, the first of which causes said valve head to engage said valve seat and block flow through said flow path means and the second of which permits flow through said flow path means thus bypassing said turbine;

a shield means surrounding said valve stem and positioned to shield said stem from hot exhaust gas passing through said bypass flow path means; and,

means for conducting a flow of cooling fluid to the valve stem in at least part of the portion thereof that is surrounded by said shield means and to the interior of said shield means and to the exterior of said shield means in sufficient quantity to cool the valve stem and provide a barrier between the shield means and said valve guide means.

4,630,446

OUTBOARD MOTOR WITH TURBO-CHARGER

Tomio Iwai, Hamamatsu, and Yukio Matsushita, Iwata, both of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan

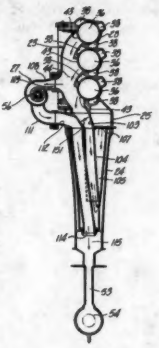
Filed May 25, 1984, Ser. No. 614,439

Claims priority, application Japan, May 27, 1983, 58-92340; May 27, 1983, 58-92341; May 27, 1983, 58-92342

Int. Cl.[4] F02B *37/00*

U.S. Cl. 60—602 22 Claims

1. A turbo-charger arrangement for an internal combustion engine having an exhaust chamber for receiving exhaust gases from a plurality of exhaust ports of respective engine chambers, an outlet from said exhaust chamber, an exhaust pipe having an inlet end communicating with said exhaust chamber outlet and an outlet end, a turbo-charger having a turbine stage inlet communicating directly with said exhaust chamber and a turbine outlet, valve means for closing said outlet for directing substantially all of the flow of exhaust gases from said exhaust chamber to said turbo-charger turbine stage inlet without flowing through said exhaust pipe, and an expansion chamber,



said exhaust pipe extending into said expansion chamber with its outlet end opening directly into said expansion chamber.

4,630,447

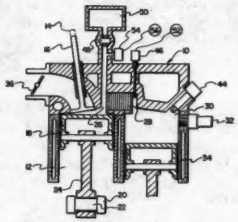
REGENERATED INTERNAL COMBUSTION ENGINE

William T. Webber, 30704 Davey Jones Dr., Agoura, Calif. 91301

Filed Dec. 26, 1985, Ser. No. 813,595

Int. Cl.[4] F02G *1/02*

U.S. Cl. 60—712 6 Claims



1. A thermally regenerated four-stroke cycle internal combustion engine, comprising:

a cold side cylinder, having:

an intake valve located through cold side cylinder wall for drawing air into said cold side cylinder;

an exhaust valve independently located through said cold side cylinder wall for emitting exhaust gases; and

a cold side piston connected to a crank shaft through a connecting rod;

a hot side cylinder having:

a fuel injector and igniter located through hot side cylinder wall; and

a hot side piston connected to a crank shaft through a connecting rod;

a regenerator duct, for connecting said cold side and said hot side cylinders and for housing a regenerator oriented so as to have its cold end adjacent to said cold side cylinder and the hot end adjacent to said hot side cylinder;

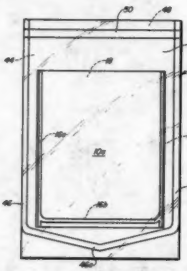
means for opening and closing the intake and exhaust valves once each two crankshaft revolutions; and

means for injecting fuel into said hot cylinder once each two crankshaft revolutions.

4,630,448
CONTAINER FOR STORING SOLID LIVING TISSUE PORTIONS

Arnold C. Bilstad, Deerfield, and William C. Brown, Palatine, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 25, 1985, Ser. No. 791,181
Int. Cl.[4] B65B 63/08
U.S. Cl. 62—60 14 Claims



1. The method of storing solid, living tissue portions, which comprises;

placing a wide-mouthed, flexible, collapsible, sterile bag into a aseptic field containing a solid tissue portion, said bag being made of sheeting of poly (ethylene-vinyl acetate) containing from 5 to 35 weight percent of vinyl acetate units;

inserting said tissue portion into said bag through the wide mouth;

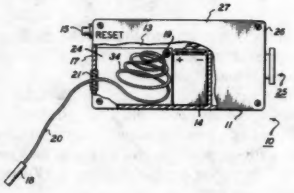
heat sealing the wide mouth of said bag; and storing said bag at a cryogenic temperature;

and after said storage, placing said bag in a second, aspetic field and opening said bag by severing said sheeting to retrieve said tissue sample.

4,630,449
MONITORING APPARATUS

William H. Adams, Auburn, N.Y., assignor to Richards Technical Products, Inc., Syracuse, N.Y.

Filed May 3, 1985, Ser. No. 730,086
Int. Cl.[4] G01K 13/00
U.S. Cl. 62—130 19 Claims



1. Apparatus for moditoring the temperature inside a refrigeration unit that experiences periodic defrost cycles of a known duration, said apparatus including

a temperature sensor located within the refrigeration unit for providing an electrical output signal indicative of the temperature level inside the unit,

a comparator means for comparing the sensor output signal level with a preset signal level and providing a first output signal when the sensed temperature level is above the preset level and a second output signal when the sensed temperature level is below the preset level,

a timer means connected to the output of the comparator means which is enabled when the comparator means produces said first output signal whereby the timer means generates a continuous chain of timing pulses and is disabled when the comparator means produces said second output signal,

counter means being coupled to the timer means for counting the number of pulses generated by the timer means and producing a counter output signal when a preset count is reached, the duration of the counter means cycle being greater than the duration of the defrost cycle, and

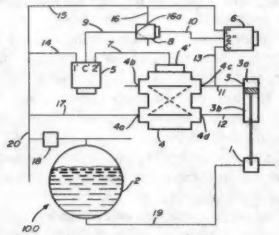
an audio means coupled to the output of both the timer means and the counter means and including an audio transducer means providing a first audible alert signal any time the timer means is enabled and a second audible alarm signal when the counter means reaches the preset count,

said audio means including time constant circuit means for actuating said audio transducer means for leading edge portions of said pulses to produce audible ticks as said first audible alert signal, and gating means enabled by said counter output signal for actuating said audio transducer means to produce an audible tone as said second audible alarm signal.

4,630,450
EXPENDABLE REFRIGERATION CONTROL

Kenneth J. Clarke, Senneville, and Gordon Lamb, Dorval, both of Canada, assignors to Conterm International Terminals, Inc., Pointe Claire, Canada

Filed May 6, 1985, Ser. No. 730,826
Int. Cl.[4] F25B 41/04
U.S. Cl. 62—222 9 Claims



1. In a refrigeration system an apparatus for controlling the opening and closing operation of a liquid flow valve for dispensing fluid fed thereto from a reservoir and using the inherent gas pressure from the reservoir, comprising in combination:

(a) a pneumatic piston operated actuator device having a piston side and a rod side, said rod side being operably connected to said flow valve for opening and closing the same; and

(b) control means for controlling the operation of said pneumatic actuator device, said control means having a first pneumatic linear timer valve having a cycle time delay and connected to a gas pressure line of said reservoir, a second pneumatic linear timer valve having an injection time delay and also connected to said gas pressure line of said reservoir, said first and second pneumatic linear timer valves being interconnected through a control valve, a pneumatic actuator control valve connected to said gas pressure line of said reservoir and to said piston side and rod side of said actuator device for controlling the operation of said actuator device, said first pneumatic linear timer valve being connected to said actuator control valve to operate same after said cycle time delay to cause said actuator device to operate said liquid flow valve to dispense fluid from said reservoir and to further actuate said second pneumatic linear device to initiate said injection time delay and open condition of said liquid flow valve

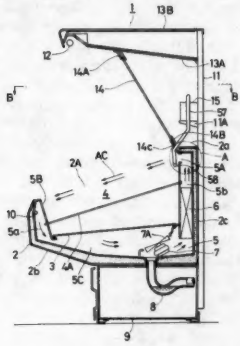
where, upon completion, of same said first pneumatic linear timer valve receives a signal through said control valve to deactivate said actuator control valve and said actuator device to close said liquid flow valve to end liquid flow from said reservoir and to recommence a further cycle time delay of said first pneumatic linear timer valve.

4,630,451

REFRIGERATED DISPLAY CABINET

Daisaburo Kishimoto, Tatebayashi, Japan, assignor to Sanyo Electric Co., Ltd and Tokyo Sanyo Electric Co., Ltd, both of, Japan

Filed Jul. 26, 1984, Ser. No. 634,807
Claims priority, application Japan, Oct. 20, 1983, 58-197030
Int. Cl.[4] A47F *3/04*
U.S. Cl. 62—247 **7 Claims**



1. A refrigerated display cabinet comprising:

an insulated cabinet body having an open side;

a partition plate disposed in said cabinet body defining therein a storage chamber and a cooled air passage, said cooled air passage having an outlet extending along one edge of said open side, said cooled air passage also having an inlet extending along an opposite edge thereof;

a refrigerating unit disposed in said cooled air passage for cooling air therein;

an air blower disposed in said cooled air passage for forcibly circulating air drawn into said inlet through said refrigerating unit, said air thereby being cooled, and then out through said outlet, said cooled air furhter returning into said inlet so as to form a cooled air curtain across said open side for cooling said storage chamber;

a mist-producing humidifier unit disposed in said body outside of said storage chamber so that said humidifier is not cooled by said cooled air curtain; and

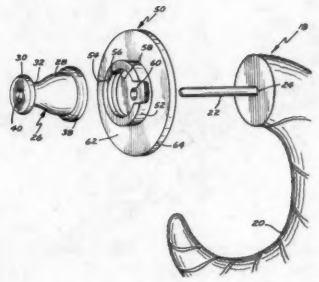
outlet pipe means for delivering mist produced by said humidifier unit for being mixed in the forcibly circulated cooled air, said outlet pipe means having an outlet port positioned in said storage chamber adjacent said outlet of said cooled air passage and on the side of said formed air curtain nearer said storage chamber, whereby said mist discharged from said outlet port of said outlet pipe means is rapidly mixed through an involving action with an inner stream of said air curtain on the side of said curtain nearer said storage chamber and is gradually dispersed in said storage chamber to uniformly humidify the interior of said storage chamber.

4,630,452

EARRING CLUTCH MECHANISM AND DETACHABLE LOAD DISTRIBUTION MEMBER FOR USE IN COMBINATION THEREWITH

Lynette M. Connelly, Staton Island, and Norman Gatof, New York, both of N.Y., assignors to Crystal Brands, Inc., New York, N.Y.

Filed Jun. 17, 1985, Ser. No. 745,468
Int. Cl.[4] A44C *7/00*
U.S. Cl. 63—12 **14 Claims**



1. For use with an earring clutch mechanism, a detachable load distribution member comprising a resilient cylindrical sleeve having inner and outer surfaces of generally uniform diameter, for receiving one end of said clutch mechanism, said sleeve having first and second ends, a flange extending outwardly a substantial distance from said sleeve and surrounding said sleeve at said first end thereof, for confronting a greater surface portion of a pierced ear lobe than would be confronted by only said one end of said clutch mechanism, and a resilient lip extending inwardly a preferred distance from said sleeve at said second end thereof for releasably retaining said one end of said clutch mechanism within said sleeve, said lip at least partially surrounding the inner surface of said sleve, the substantial distance said flange extends outwardly from said first end of said sleeve being appreciably greater than the preferred distance said lip extends inwardly from said second end of said sleeve.

4,630,453

APPARATUS AND METHOD FOR SECURELY FASTENING VARIOUS PIERCED EARRING POSTS

Cullen L. Burkett, 515 Robin Dr., Seneca, S.C. 29678

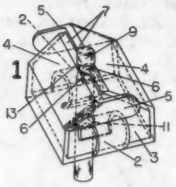
Filed Jun. 20, 1985, Ser. No. 746,646
Int. Cl.[4] A44C *7/00*
U.S. Cl. 63—12 **4 Claims**

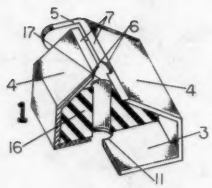
1. An apparatus for securing threaded post earrings, conventional, indented shoulder post earrings, and earrings fitted with a specially designed post having a shoulder of such shape as to be positively held in the apparatus, comprising:

(a) a finger-releasable means for receiving and positively retaining any one of the ends of said specially designed post earrings, threaded post earrings and conventional indented shoulder post earrings, and;

(b) a clutch means for receiving, guiding, and retaining said one earring post end when the latter is received by said

finger-releasable means, said clutch including means positioned to act as a back-up gripping device to an earring





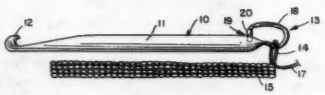
post which may become released from the primary finger-releasable means of said apparatus.

4,630,454

DEVICE FOR HOLDING INTERIM CROCHET STITCHES AGAINST UNRAVELLING

Carmella M. Seremjian, 10721 Greenbay Rd., Kenosha, Wis. 53142

Filed Oct. 3, 1985, Ser. No. 783,668
Int. Cl.[4] D04B *35/00*
U.S. Cl. 66—1 A **14 Claims**



1. A device for temporarily holding an interim crochet stitch against unravelling when a crochet hook is removed from the loop of the stitch, comprising:

an elongated body having opposite ends;

a flexible stitch retainer substantially shorter than said body and having a proximal end and a distal end;

said proximal end of said retainer fixedly attached to one end of said body;

said retainer being freely extensible from said one end of said body for extending the retainer through said stitch for holding the stitch against unravelling;

latching means on said distal end of said retainer;

complementary latching means on said body adjacent to said one end;

and said latching means being operable by manipulation of said retainer for latching cooperation for holding said distal end latched to said body for maintaining said retainer in the stitch retaining relation to said one end of the body and said latching means being releasable by manipulation of said retainer for releasing said retainer distal end relative to said body for releasing said stitch from said retainer.

4,630,455

TRIPLE ROLL, LAYER TOP, SOCK

Ralph E. Lingenfelter, Union Point, Ga., assignor to Chipman-Union, Inc., Union Point, Ga.

Filed Mar. 19, 1984, Ser. No. 591,175
Int. Cl.[4] D04B *9/46*
U.S. Cl. 66—172 R **15 Claims**

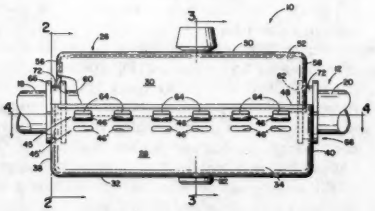
1. A knitted sock of the type having a body and a top connected to said body, said body having a neck portion adjacent to said top, wherein the improvement comprises the top including a first top increment, a second top increment connected along a common first border portion to said first top increment, a third top increment connected along a common second border portion to said second top increment and along a common third border portion to said neck of said body, said first top increment having an outer edge for connection to said neck portion and extending downwardly from said outer edge and from said first border portion over the neck of said body, said third top increment extending from said third border portion and said second border portion upwardly from the neck of said body, said second increment extending upwardly from said first border portion and said second border portion in overlapping fashion over said third top increment, and means for securing said first increment and said third increment to said neck portion and for securing said second increment to said first increment.

4,630,456

CASKET LOCK FOR VALVE ASSEMBLY

Anker J. Nielsen, Jr., Holden, Mass., assignor to Inner-Tite Corporation, Springfield, N.J.

Filed May 7, 1984, Ser. No. 607,576
Int. Cl.[4] F16K *35/00*
U.S. Cl. 70—232 **11 Claims**



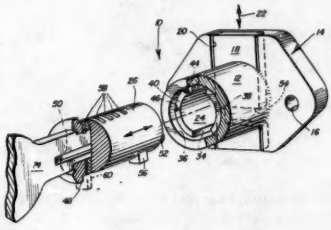
1. A casket lock for a valve assembly including a valve, coaxially aligned generally cylindrical inlet and outlet conduits extending in axially opposite directions from said valve, and connecting means for securing the conduits to the valve, said casket lock comprising a pair of telescopically mating casket sections having open and closed positions, one of said casket sections having a marginal portion telescopically received within an and in overlapping relation with an associated marginal position of said other of said casket sections when said casket sections are in said closed position, adjustable hinge means for connecting said casket sections together to move

about a hinge axis between said open and closed positions and including a plurality generally paralled rows of apertures formed in a marginal edge portion of one of said casket sections and a row of spaced prongs integrally connected to and projecting form a marginal edge portion of the other of said casket sections for positioning within the apertures of a selected one of said rows, said prongs projecting outwardly from within said casket through said apertures of said selected one of said rows when said casket sections are in said closed position, each of said casket sections having cutout portions at its opposite ends in generally opposing relation to said cutout portions in the other of said casket sections, said cutout portions cooperating in said closed position to define a pair of coaxially aligned generally circular openings of adjustable size in said casket at axially opposite ends of said casket and disposed in axially parallel alignment with said hinge axis for receiving the inlet and outlet conduits of an associated valve assembly therethrough, said casket sections cooperating in said closed positions to define a casket for containing the valve and the connecting means, said openings receiving the inlet and outlet conduits therethrough when said casket sections are in said closed position, and locking means including a fastener within said casket for releasably securing said casket sections in said closed position and a lock for preventing access to said fastener when said casket sections are secured in said closed position by said locking means, said adjustable hinge means and said locking means cooperating to define means for adjusting the size of said openings to receive conduits of differing size.

4,630,457
LOCK WITH REMOVABLE PLUG

Herbert Kincaid, Libertyville, and Alan D. Favia, Lake in the Hills, both of Ill., assignors to Eastern Company, Naugatuck, Conn.

Filed Dec. 24, 1984, Ser. No. 685,473
Int. Cl.⁴ E05B 29/04
U.S. Cl. 70—369 **11 Claims**

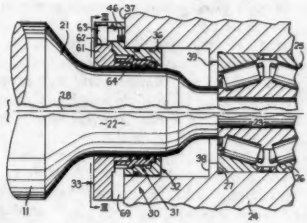


1. A lock comprising:
a lock barrel with an opening therein;
a key plug rotatable within the barrel opening between first and second operative positions and a third position in which the plug can be withdrawn from the barrel;
a first tumbler adapted to lock the plug against turning within the barrel;
a second tumbler adapted to prevent the plug from turning to the third position and allowing rotation between the first and second positions;
an annular slot in the barrel adapted to receive the second tumbler as the plug is turned between the first and second positions;
a shoulder with an axial slot in the barrel; and
a tab on the plug, said tab abutting the barrel shoulder to hold the plug therein during turning between the first and second positions, and said tab further being aligned with the axial slot when the plug is in the third position.

4,630,458
SEAL ARRANGEMENT FOR MILL ROLL

Kenneth G. Kakabaker, Kalamazoo, Mich., assignor to Durametallic Corporation, Kalamazoo, Mich.

Filed Mar. 12, 1985, Ser. No. 710,822
Int. Cl.⁴ B21B 27/10, 31/07
U.S. Cl. 72—237 **7 Claims**



1. In a mill roll assembly having a pair of large-diameter rotatable rolls disposed in parallel relation, the rolls being disposed adjacent one another to define a nip therebetween through which metal stock is fed, means for discharging coolant on the metal stock in the vicinity of said nip, each roll having support shafts of slightly reduced diameter projecting coaxially outwardly from opposite ends thereof, each said shaft projecting into an opening in a stationary stand, and bearing means disposed within said opening for rotatably supporting said shaft on said stand, the improvement comprising:
an isolator assembly coacting between said shaft and said stand adjacent the outer end of said opening for isolating said bearing means from the coolant, said isolator assembly including first, second and third isolator rings which substantially concentrically surround said shaft and are concentric with one another for cooperation between said shaft and said stand;
said first isolator ring being nonrotatably secured to said stand and having an annular sleevelike hub part which projects coaxially into said opening from the outer end thereof and is sealingly coupled with the wall of said opening;
said second isolator ring being nonrotatably fixed relative to said stand and cooperating with said first isolator ring to effectively close off the outer end of said opening, said second isolator ring including a sleeve part which closely surrounds said shaft to define a first radially narrow but axially elongated clearance space therebetween, said first clearance space at its axially outer end being in communication with the surrounding environment containing the coolant;
said sleeve part defining thereon an exterior annular surface of substantial axial extent which is concentrically surrounded by an interior annular surface of substantial axial extent as defined on said first isolator ring, said interior and exterior surfaces being radially spaced a substantial distance apart to define an annular clearance region therebetween of substantial radial and axial extent, said region at the outer axial end thereof being closed by the cooperation of said first and second isolator rings;
said third isolator ring being concentrically and nonrotatably mounted on said shaft within said opening and having a main hub portion directly adjacent the inner axial end of said sleeve part, said third ring having an annular flange part which projects axially outwardly from said main hub portion into said annular region, said flange part having an inner annular surface thereon which concentrically surrounds and is closely adjacent the exterior annular surface on said sleeve part to define a second annular clearance space therebetween of narrow radial but substantial axial extent, said second clearance space at the inner axial end thereof communicating with the axially inner end of the first clearance space through a radially directed clearance

passage which extends between the opposed ends of said main hub portion and said sleeve part, said flange part having an exterior annular surface which is substantially concentric with but spaced a substantial distance from said interior annular surface as defined on said first ring to define therebetween an annular collection chamber of substantial axial and radial extent which communicates with the axially outer end of said second clearance space through a radial passage which extends across the free end of said flange part;

said third ring having an annular dam-like wall fixed to and projecting radially outwardly therefrom adjacent the inner axial end of said flange part, said dam-like wall having an outer annular surface which is positioned close to but spaced from the interior annular surface on said first ring;

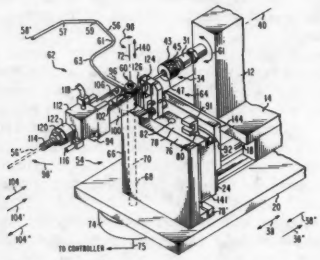
said first ring having an annular flange portion which is fixed thereto and projects radially inwardly from said interior annular surface, said last mentioned flange portion being disposed axially inwardly of but closely axially adjacent said dam-like wall, said annular flange portion and said dam-like wall having closely adjacent and axially opposed surfaces which define therebetween a narrow passage which projects radially from a location disposed adjacent said inner annular surface to a location for communication with a third annular clearance space which is of small radial but substantial axial extent as formed between said flange portion and said main hub portion, said third clearance space at said inner axial end thereof being connected for communication with that portion of the opening containing the bearing means.

4,630,459

AUTOMATIC COAXIAL CABLE BENDING APPARATUS

George A. Elliott, Maple Shade, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 3, 1985, Ser. No. 740,716
Int. Cl.[4] B21D 7/02
U.S. Cl. 12—307 13 Claims



1. An automatic coaxial cable bending apparatus comprising:

a base;

a chuck for automatically securing and locating an end of said cable at a reference point on a given axis;

cable positioning means secured to the base for automatically selectively moving said chuck so that said reference point and cable end are displaced to a second point on said axis and including means for selectively rotating said chuck and said cable about said axis;

bend means secured to the base including a cable pressure die for automatically engaging and bending said cable at a third point spaced a predetermined distance from the second point, said bend means further including a bend die rotatable about a stationary axis relative to the base and a stationary cable support die fixed in place to the base relative to the bend die to support bending loads induced by said cable during said bending, said bend and support dies being adapted to support the cable during said selective moving of the chuck, said pressure die being secured to rotate relative to and about the bend die in a direction away from said support die during the bending engaged state and to automatically return to the initial position in the opposite direction; and

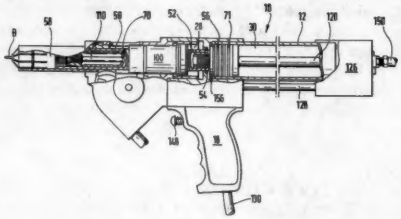
clamp means secured to the base adjacent to said support die adapted to selectively hold said cable in a first clamp region between said support die and said chuck and to selectively displace to a second idle region, said cable positioning means including means selectively displacing said chuck adjacent said bend means in said first region when said clamp means are in the idle region.

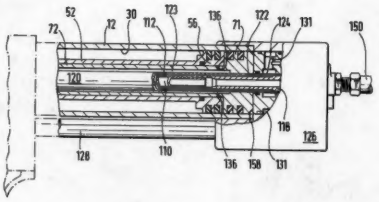
4,630,460

FASTENER-SETTING TOOL

Dieter Mauer, Lollar, Fed. Rep. of Germany, assignor to USM Corporation, Farmington, Conn.

Filed Feb. 14, 1986, Ser. No. 830,311
Int. Cl.[4] B21J 15/00
U.S. Cl. 72—391 5 Claims





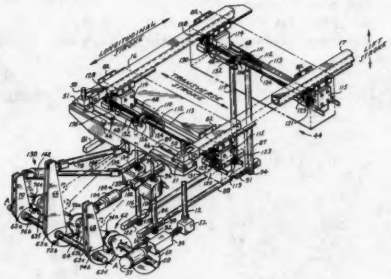
1. A tool for setting two-part fasteners of the kind in which one part requires to be pushed and the other pulled to set the fastener, comprising a housing, a thrust member reciprocable back and forth along an axis of the housing and having a fastener-engaging face at its forward end to push on said one part of the fastener in a fastener-setting operation, and pulling means also reciprocable within the housing along said axis to pull the other part of the fastener relative to the thrust member in the fastener-setting operation, characterized in that the thrust member comprises a sleeve with a piston at its rear end slidable in a fluid-pressure cylinder, and said pulling means also comprises a sleeve projecting forwardly into that of the thrust member and having a piston at its rear end slidable in said cylinder behind that of the thrust member, fluid passages being provided in the housing to enable pressurized fluid to act on the rear of the piston of the pulling means to advance both pistons, and in front of the piston of the thrust member to retract them both, there being also a fluid passage through the sleeve of the pulling means adjacent its piston which thus opens into said cylinder between said pistons and through which fluid under pressure can be introduced to separate said pistons and effect a fastener-setting stroke of the tool.

4,630,461

TRANSFER FEED MECHANISM FOR POWER PRESSES

Ronald Votava, North Riverside, Ill., assignor to Avondale Industries, Inc., New York, N.Y.

Filed May 17, 1985, Ser. No. 735,437
Int. Cl.[4] B21J *13/08*
U.S. Cl. 72—405 10 Claims



1. A power press with a transfer feed mechanism comprising the combination of:

multiple finger units for moving successive workpieces along a plurality of mutually perpendicular axes so as to transfer the workpieces to desired work stations in desired positions and attitudes,

a main drive connected to said power press for driving said press,

a power takeoff from the main drive of said power press,

a plurality of drive means connected to said power takeoff through at least one differential mechanism for independently driving said finger units along said mutually perpendicular axes in synchronism with said power press, and

a secondary drive motor connected to said drive mechanism for driving said finger units along at least one of said axes independently of said power takeoff,

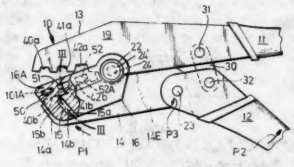
whereby said differential mechanism connected to both said power takeoff and said secondary drive motor permits said finger units to be selectively driven by either said power takeoff or said secondary drive motor in order to adjust said transfer feed mechanism along said mutually perpendicular axes.

4,630,462

TOOL FOR CRIMPING CABLE SHOE TERMINALS

Hans Wiener, Täby, and Hans Undin, Åkersberga, both of Sweden, assignors to C. A. Weidmuller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Mar. 12, 1985, Ser. No. 710,856
Claims priority, application Sweden, Jan. 3, 1985, 8500018
Int. Cl.[4] B21D *7/06*
U.S. Cl. 72—410 20 Claims



1. A tool for crimping cable shoe terminals having a contact part and an affixing part onto the ends of electrical conductors and comprising in combinaton:

a pair of jaws, each jaw having a free forward end and a rear end, one jaw being a relatively fixed first jaw and the other jaw a relatively movable second jaw pivotable between an open end position and a closed end position in regard to the first jaw;

at least one die element at each said jaw, between which die elements the affixing part of a cable shoe is crimped when the second jaw has reached its closed end position;

a pivot pin means pivotally connecting said jaws one with another at their rear ends;

an actuating means for moving the second jaw between said end positions thereof;

a locator member for fixing in a predetermined position relative to a pair of said die elements a cable shoe to be treated, said member comprising a rocker arm having an inner face facing the pair of jaws, a forward end adjacent said free forward ends and a rear end adjacent said pivoted rear ends and being at that rear end pivotally mounted on said pivot pin means:

in said rocker arm, intermediate to both said ends thereof, and in alignment with each pair of said die elements, a retaining member for the contact part of a cable shoe to be treated, each said retaining element having an entrance opening defined by a continuous surface at said inner face and being in the direction toward the first jaw spanned by a bridging element;

a means for releasably urging said rocker arm to retain its relative pivotal position in regard to the first jaw;

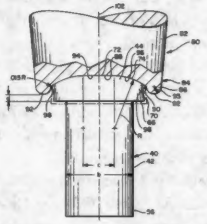
a pair of coacting carrier means on the rocker arm and the second jaw respectively for pivoting, when in mutual engagement, the rocker arm into an initial position as the second jaw is pivoted into its open end position, said bridging element defining a means for carrying the rocker arm into a terminal position when the second jaw is pivoted into its closed end position so as to crimp fhe affixing part of said cable shoe between the die elements of the first and second jaws; said urging means releasably holding the rocker arm in said terminal position and said carrier means being located so as to reengage one another and thereby to carry the rocker arm, overruling the urging means, back into its initial position only after the second jaw already has executed a part of its return movement into the open end position, the just crimped affixing part being thus liberated from the die element in the first jaw when the second jaw commences the said return movement and the rocker arm is still retained in its terminal position, and is liberated from the die element in the second jaw after said reengagement has occurred.

4,630,463

RIVET DRIVING DIE AND METHOD

Dale E. Knowlton, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 28, 1984, Ser. No. 675,771
Int. Cl.[4] B21J *13/02*
U.S. Cl. 72—479 8 Claims



1. A method of driving a rivet, where the rivet comprises:

a. an elongate shank having a lengthwise axis and being adapted to fit through an opening in material to be riveted

together, where the material has a top surface, a bottom surface, and an annular surface defining said opening and extending between said top and bottom surfaces;

b. a head attached to one end of the shank, the head having a generally circular configuration relative to planar cross sections perpendicular to the longitudinal axis, said head comprising:

1. a first bottom annular surface adapted to engage an annular top surface portion of the top surface of the material;

2. a second circumferential generally laterally facing surface portion extending upwardly from said bottom annular surface with a substantial alignment component parallel to the lengthwise axis;

3. a third upper middle central surface portion that is substantially planar;

4. a fourth upper annular intermediate surface portion that is convexly curved and extends between said central surface portion and said lateral surface portion;

said method comprising:

a. providing a die having an end driving portion which comprises:

1. an annular outer circumferential containing lip portion, having a fifth lower annular surface portion and a sixth inwardly facing annular containing surface portion extending upwardly from the first lower annular surface portion;

2. a recessed driving portion located within the lip portion, said driving portion having a seventh metal middle main contact surface portion and an eighth intermediate secondary contact surface portion extending between the seventh main contact surface portion and said sixth containing surface portion;

b. arranging said seventh middle contact surface portion and said eighth secondary contact surface portion relative to the third upper central surface portion and the fourth intermediate surface portion of the rivet head so that when the end driving portion of the die is placed over the rivet head in driving relationship, least part of said eighth surface portion is spaced from said fourth surface portion;

c. impacting said die to drive the rivet, so that said seventh surface portion initially comes into driving contact with the third surface portion so that a major portion of driving force from the die is transmitted through said third surface portion to in turn transmit substantial driving force directly into said shank, after which said eighth surface portion comes into greater driving engagement with said fourth surface portion;

d. utilizing said sixth containing surface portion, which is configured and sized relative to the second lateral surface portion to fit closely around said second surface portion, to properly locate the end driving portion of the die laterally relative to the rivet head;

e. arranging said fifth lower annular surface portion relative to the seventh and eighth surface portions so that with the seventh and eighth surface portions coming into driving engagement with the third and fourth surface portions, said fifth surface portion remains spaced upwardly from the top surface of the material that is being riveted together.

4,630,464

METHOD FOR THE CONTINUOUS SURVEILLANCE OF THE POISON CONTENT OF EXHAUST GASES CONTAINING PARTICULATE MATTER

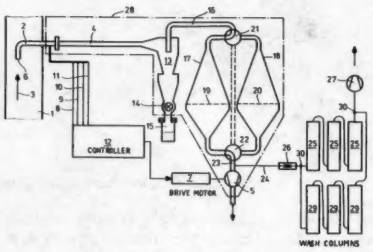
Sonja Maul, Straubenhardt; Erwin Büttner, Stutensee; Heiner Meichelböck, Eggenstein-Leopoldshafen; Albert Merz, and Hubert Vogg, both of Karlsruhe, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jun. 11, 1985, Ser. No. 743,482

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422062

Int. Cl.[4] G01N *15/02*

U.S. Cl. 73—28 2 Claims



1. A methed for the continuous surveillance of the poison content of exhaust gases containing particulate material such as the exhaust gases of large furnaces or waste incinerators wherein a sampling stream is continuously drawn from the exhaust gas stream through a suction line at a rate which corresponds to the exhaust gas stream flow rate and the particulate material is separated from the sampling gas stream under temperature-controlled conditions, said method being characterized by the following steps:

(a) continuously separating from the sample gas stream in a gas cyclone as a first separation step any coarse particulate material,

(b) continuously discharging the separated coarse particulate material from the gas cyclone, by means of a rotating lock, into a storage container,

(c) continuously separating any fine particles suspended in the sample gas stream from the gas stream in alternatively connectable filter structure with exchangeable fine filters,

(d) continuously drawing, with respect to the sample gas stream, a small partial gas stream from the sample gas stream downstream of said filter structure and conducting said partial gas stream through wash columns containing a liquid adapted to absorb any poisonous gases contained in said partial gas stream, and

(e) determining, for a standard, the poison distribution in the exhaust gas stream from sample analysis of the material collected in the storage container, on the filters and in the wash liquid and, after establishment of the standard by the initial determination of the poison distribution in the exhaust gas stream, collecting only the coarse particulate material of the first separation step and determine therefrom the poison distribution in the exhaust gas on the basis of said standard.

4,630,465

LOW VISCOUS DRAG KNOCK SENSOR

Bruce M. Hatton, Carol Stream, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 19, 1984, Ser. No. 672,402

Int. Cl.[4] G01L *23/22*

U.S. Cl. 73—35 14 Claims

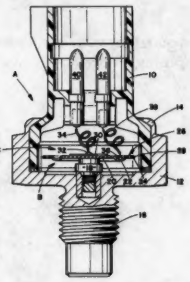
1. A low viscous drag knock sensor comprising:

a housing defining an interior air filled chamber therein, the

housing being operatively connectable with an internal combustion engine to be vibrated in response to engine knock;

a diaphragm mounting member operatively connected with the housing and disposed in the housing chamber;

a diaphragm including a central portion, a stiffening rib surrounding the central portion, and an edge portion disposed peripherally around the stiffening rib, the diaphragm central portion being mounted to the diaphragm mounting member, the diaphragm edge portion being supported only by the diaphragm stiffening rib and diaphragm central portion such that the diaphragm edge portion is free to move relative to the housing;



the diaphragm peripheral edge portion defining a plurality of passages therethrough for reducing drag from air flowing from one side of the diaphragm to another during vibratory displacement thereof, whereby the passages reduce a resonant frequency bandwidth of the diaphragm; and,

a transducer for providing an electrical output signal which varies with sensed vibratory displacement, said transducer being operatively connected to the diaphragm central portion to produce an output electrical signal which varies with vibratory displacement thereof.

4,630,466

APPARATUS FOR TESTING ROD-SHAPED ARTICLES OF THE TOBACCO PROCESSING INDUSTRY

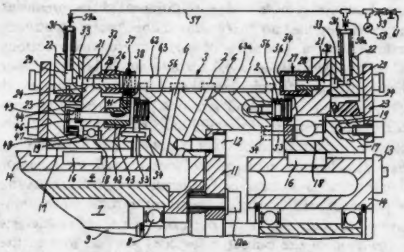
Herbert Berlin, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Oct. 2, 1984, Ser. No. 657,007

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1983, 3336667

Int. Cl.[4] G01M *3/04*

U.S. Cl. 73—38 **10 Claims**



1. Apparatus for testing rod-shaped articles of the tobacco processing industry wherein an openended tubular wrapper surrounds a filler of tobacco and/or filter material, comprising means for conveying a succession of articles sideways past a testing station, including elongated receiving means for the articles; carrier means adjacent to one end of each of said receiving means and arranged to move with said conveying means; elastically deformable tubular sealing elements provided on said carrier means, one for each of said receiving means and each in register with the adjacent end of the article in the respective receiving means; means for effecting a relative movement between said conveying means and said carrier means so that the ends of articles at said testing station penetrate into the respective sealing elements; substantially annular clamping members, one for each of said sealing elements and each surrounding the respective sealing element; and actuating means for varying the diameters of said clamping members so as urge the respective sealing elements into sealing engagement with the peripheral surfaces of the article ends therewithin during travel of articles past said testing station.

4,630,467

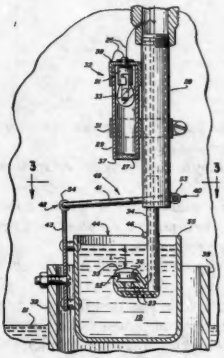
LEAK DETECTOR

Frank J. Senese, and Lloyd A. Baillie, both of 400 E. Sibley Blvd., Harvey, Ill. 60426

Continuation of Ser. No. 616,042, Jun. 1, 1984, abandoned, which is a division of Ser. No. 340,439, Jan. 18, 1982, Pat. No. 4,453,400. This application Feb. 22, 1985, Ser. No. 704,230

Int. Cl.[4] G01M *3/38;* G01F *23/10*

U.S. Cl. 73—49.2 **8 Claims**



1. A method for detecting small leaks in a tank storing a liquid, said tank having

a float means positioned in contact with said stored liquid,

a detector means and

a signal means in fixed relationship to each other,

said float means moving in relationship to the level of said stored liquid and having a reservoir means for holding a measuring medium, said measuring medium being capable of modulating a signal characteristic representative of the position of said detecting means, comprising

sealing said float means to prevent the condensation of vapors within said float means,

positioning initially said float means at a depth approximately equal to V_L/S_L,

said V_L comprising the volume of said stored liquid and S_L comprising the free surface area of said stored liquid,

emitting a signal having a characteristic from said signal means into said measuring medium,

modulating said signal characteristic by an amount which varies with the changes in the location of said float means,

detecting said modulated signal characteristic, and

producing a response signal directly related to said detected characteristic,

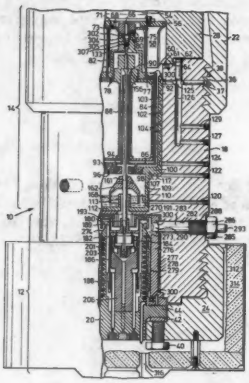
wherein changes in said response signal are indicative of small leaks in said tank.

4,630,468

VISCOMETER

Edmund G. F. Sweet, Ontario, Canada, assignor to Ontario Research Foundation, Mississauga, Canada

Filed Sep. 27, 1983, Ser. No. 536,307
Claims priority, application Canada, Aug. 9, 1983, 434176
Int. Cl.[4] G01N *11/14*
U.S. Cl. 73—59 **31 Claims**



1. An apparatus for measuring the viscosity of a fluid medium, comprising:

means for rotating a first member at an accurately known rate,

a freely turning rotary member having an axis of rotation and having a first portion adjacent said first member but out of contact therewith,

a first fluid cavity between said first member and said first portion,

a fluid being located in said first fluid cavity such that rotation of the first member will place torque on said rotary member thus seeking to induce rotation therein,

the rotary member having a second portion moving adjacent a fixed surface but out of contact therewith,

a second fluid cavity between said second portion and the fixed surface into which can be placed said fluid medium of which the viscosity is to be measured,

and means to measure the rotational speed of the rotary member.

4,630,469

SAMPLE HOMOGENIZER

Robert K. Bade, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 30, 1985, Ser. No. 781,563
Int. Cl.[4] G01N *30/02*
U.S. Cl. 73—61.1 C **7 Claims**

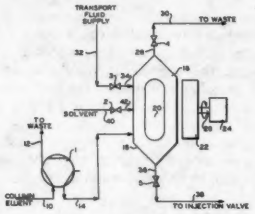
1. A chromatograph sample homogenizer comprising a mixing chamber containing means for homogenizing a mixture therein and connected thereto:

(a) a first valved inlet for eluant from a chromatographic column comprising a first valve and connecting conduit;

(b) a second valved inlet for solvent comprising a second valve and connecting conduit;

(c) a third valved inlet for transport fluid supply comprising a third valve and connecting conduit;

(d) a fourth valved outlet for waste comprising a fourth valve and connecting conduits; and



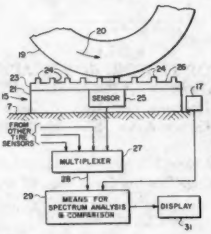
(e) a fifth valved outlet for sample injection to a downstream analyzer comprising a fifth valve and connecting conduit.

4,630,470

REMOTE SENSING OF VEHICLE TIRE PRESSURE

Robert L. Brooke, Woodbridge; Peter J. McConnell, Vienna, both of Va.; Anthony M. Testa, Elkridge, Md., and George B. Maksymonko, Springfield, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 16, 1984, Ser. No. 672,327
Int. Cl.[4] G01M *17/02*
U.S. Cl. 73—146.2 **6 Claims**

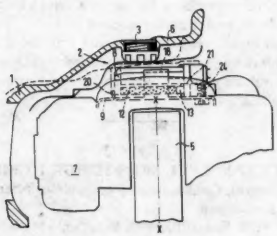


1. Apparatus for remotely sensing differential tire pressures of vehicles as they pass an instrumented checkpoint on a roadway, comprising: a plurality of rigid corrugated sections adapted to be adjacently arrayed across a single lane roadway so that each tire of each vehicle will simultaneously traverse at least two adjacent corrugated sections, said corrugated sections comprising a series of parallel hard ridges arranged perpendicular to the direction of vehicle travel, with a transducer or sensor attached to each of said corrugated sections for detecting vibrations indicative of different tire pressures as the vehicle traverses said corrugated sections, circuit means connected to all of said sensors for performing a spectral analysis and comparison of the output of each of said sensors to the outputs of all other of said sensors as the vehicles traverse said array of corrugated sections, and display means connected to said circuit means for indicating the tire or tires of vehicles which produce an abnormal spectrum indicative of abnormal tire pressure.

4,630,471
TEMPERATURE RESISTANT TIRE PRESSURE CONTROL DEVICE

Axel Kamprath, Mühlacker, and Volker Ruehr, Leinfelden-Echterdingen, both of Fed. Rep. of Germany, assignors to Dr. Ing.h.c.F Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 4, 1985, Ser. No. 707,575
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1984, 3407895
Int. Cl.[4] G01L *9/00;* **G01M** *17/02*
U.S. Cl. 73—146.5 **14 Claims**

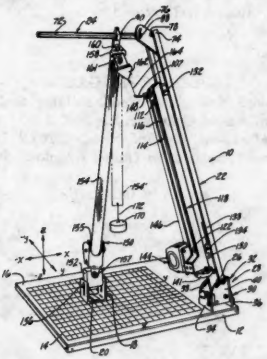


1. An apparatus for the heat-insulated placement of an electronic emitter which is part of a tire pressure control device which is situated adjacent to a wheel rim on a caliper of a brake disk arrangement of a motor vehicle, the tire pressure control device having a rotating manometric switch attached to a side of said wheel rim, said switch interacting with said emitter so that impulses are generated in said emitter, the apparatus comprising, a housing for mounting the emitter to the caliper, said housing having receiving means for holding the emitter and a bottom portion containing insulating material for thermally isolating the emitter from heat generated in the area of the caliper.

4,630,472
SEAT BELT TESTING DEVICE

Karen A. Zimmerman, Allen Park; Randall L. Weston, Sterling Heights, and Richard D. Thomas, Wixom, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Sep. 3, 1985, Ser. No. 771,874
Int. Cl.[4] G01L *5/00;* **G01N** *3/26*
U.S. Cl. 73—161 **4 Claims**



1. A three-dimensional seat belt testing apparatus comprising;

a horizontally disposed support base having X and Y axes intersecting at an origin with a vertically disposed Z-axis of an X, Y and Z coordinate system;

a seat belt retractor anchor bracket adapted to be selectively positioned on said base coordinate system relative to said origin;

means for pivotally securing a seat belt retractor to said anchor bracket;

an articulated arm assembly comprising a primary arm and a secondary arm;

said primary arm having upper and lower ends, said primary arm lower end mounted by dual pivot means on said base adjacent said origin for adjustable movement in both a first plane defined by said X and Z axes and a second plane defined by said Y and Z axes;

said secondary arm pivotally mounted on the upper end of said primary arm for adjustable movement in a plurality of positions so as to be maintained parallel to said x-axis;

means for adjustably positioning a seat belt turning loop on said secondary arm permitting graduated angular and longitudinal positioning of said turning loop relative to the axis defined by said secondary arm;

elevator means on said primary arm for raising and lowering truck means along an axis parallel to said primary arm;

a flexible cantilevered beam having a fixed end and a free end, said fixed end secured to said truck means for movement therewith;

said retractor including a spool mounted roll of seat belt webbing mounted on a spring biased reel, said roll of webbing adapted to be extracted from said reel with its free end threaded through said turning loop;

rotary deflection transducer means mounted adjacent said primary arm lower end, said rotary deflection transducer means including a cable adapted to be reeled from said transducer means, said cable having its free end attached to said truck means, whereby said rotary deflection transducer measures the linear travel of said truck means;

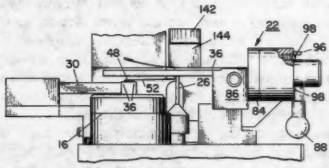
means securing the free end of said cantilevered beam to latch plate simulator means attached to said belt webbing free end, and

force transducer means mounted on said beam adjacent to its free end for measuring the maximum bending movement applied to said beam upon said elevator means moving said truck means from an initial predetermined position adjacent said primary arm upper end to a second position adjacent said primary arm lower end, whereby the force required to extract said belt webbing from said retractor means may be directly measured and correlated relative to the linear travel recorded by said rotary deflection transducer means for a plurality of relative spacial locations occupied by said retractor means and said turning loop.

4,630,473
VERSATILE FORCE MEASURING SYSTEM

Kyong Park, Chatsworth, and Goran S. Alwerud, Granada Hills, both of Calif., assignors to Kavlico Corporation, Chatsworth, Calif.

Filed Mar. 5, 1985, Ser. No. 708,088
Int. Cl.[4] G01L *5/00;* **G01N** *3/20*
U.S. Cl. 73—161 **19 Claims**



10. A force measuring apparatus for measuring the deflec-

tion force of spring-mounted magnetic heads, or similar part comprising:

a base;

a force or pressure transducer mounted on said base and having a predetermined axis along which force is preferably applied thereto;

movable carriage means for holding a part to be tested under predetermined levels of deflection;

means for mounting an elongaged flexible part securely on said carriage with the part extending substantially perpendicular to said predetermined axis;

means for guiding one portion of said part into a deflection measuring position in force-transmitting coupling with said transducer along said predetermined axis, and for shifting said part between said deflection measuring position and a loading position wherein said part is spaced laterally away from said axis;

means for providing a controlled amount of deflection of said part as it applies force to said transducer; and

means for determining the force applied to said transducer from the output from said transducer.

4,630,474

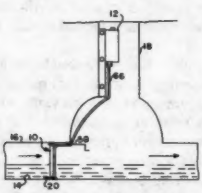
FLOW ANALYZER

Peter D. Petroff, 4102 Piedmont Dr., Huntsville, Ala. 35802

Division of Ser. No. 407,996, Aug. 13, 1982, Pat. No. 4,407,158, which is a division of Ser. No. 264,644, May 18, 1981, Pat. No. 4,344,329, which is a division of Ser. No. 104,540, Dec. 17, 1979, Pat. No. 4,295,197, which is a division of Ser. No. 905,196, May 12, 1978, Pat. No. 4,211,111, which is a division of Ser. No. 811,557, Jun. 30, 1977, Pat. No. 4,116,061, which is a division of Ser. No. 602,974, Aug. 8, 1975, Pat. No. 4,070,563. This application Sep. 26, 1983, Ser. No. 535,711

Int. Cl.[4] G01F *1/52*

U.S. Cl. 73—196 **4 Claims**



1. A system of measurement of flow values in a sewer system including first and second sewer access manhole enclosures and there being included in said system a first channel having at least a circular lower region, and said first channel providing flow accessible from said first sewer access manhole enclosure, and a second channel having at least a circular lower region, and said second channel providing flow accessible from said second sewer access manhole enclosure, and each said channel comprising a circular pipe in a region just preceding, flowwise, a said sewer access manhole, and said system of measurement comprising:

at least first and second monitoring assemblies, said first monitoring assembly being located at said first sewer access manhole, and said second monitoring assembly being located at said second sewer access manhole, and wherein each monitoring assembly comprises:

liquid height sensing means comprising a pressure-to-electrical signal transducer for sensing liquid height above it and providing, as an output, an electrical signal which is a function of such liquid height,

mounting means for positioning each said transducer adjacent an existing bottom of a said circular lower region of a said channel accessible from the said sewer access manhole enclosure,

timing means synchronizable with timing means in each other said monitoring assembly for providing timing signals,

analog-to-digital conversion means responsive to timing signals from said timing means and signals from said liqud height sensing means for periodically converting said signals into digitally encoded, time identifiable signals which are a function of said liquid height, and

memory means responsive to said analog-to-digital conversion means for storing discrete time identifiable said digitally encoded liquid height function signals covering periodic measurements over a selected period of time;

transfer storage means, responsive to said first and second monitoring assemblies, for storing liquid height function signals from said memory means; and

conversion means responsive to said transfer storage means for converting said digitally encoded signals derived from said monitoring assemblies to timewise relatable liquid flow values.

4,630,475

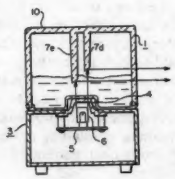
FIBER OPTIC LEVEL SENSOR FOR HUMIDIFIER

Saburo Mizoguchi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Saka, Japan

Filed Mar. 20, 1985, Ser. No. 714,161

Int. Cl.[4] G01F *23/02*

U.S. Cl. 73—293 **6 Claims**



1. A humidifier comprising a water tank and an atomization chamber mounted on a bottom section having driving means therein, said water tank having an external wall and a bottom wall means made of a transparent material and having a surface substantially exposed to the exterior, a light source mounted on support means beneath said bottom wall means for emitting light into said water tank, and a means on said bottom wall means for guiding and leading said light onto said external wall, the water level in said tank being detectable visually through said external wall by said light.

4,630,476

LIQUID LEVEL GAUGE

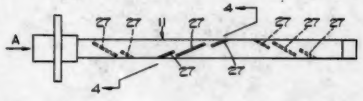
Raymond Moore, Solihull, England, assignor to Lucas Industries Public Limited Company, England

Filed Aug. 13, 1985, Ser. No. 765,217

Claims priority, application United Kingdom, Sep. 11, 1984, 8422910

Int. Cl.[4] G01F *23/02*

U.S. Cl. 73—293 **7 Claims**



1. A liquid level gauge comprising an elongate support member, a plurality of optical fibres carried by the support member, said fibres extending on the support member gener-

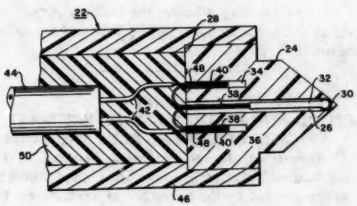
ally lengthwise thereof and generally parallel to each other, and a light source disposed at one end of the support member, each of said fibres having one end adjacent said one end of the support member and communicating with the light source to receive light therefrom, said fibres being spaced apart from each other circumferentially of the support member and each fibre being divided at a point along the length of the support member by a gap so arranged that the transmission of light from said source across the gap from one part of the fibre to the other part thereof is determined by the presence or absence in the gaps of the liquid being gauged, the gaps of the fibres being spaced lengthwise of the support member, and the faces of each fibre presented to one another across the gap of the fibre being parallel and lying at an angle to the length of the fibre such that, in the absence of liquid to be gauged in the gap, light from said source passing along the fibre and striking a face will be totally internally reflected, whereas, when liquid to be gauged fills the gap, light from one part of the fibre can be conducted across the gap by the liquid to the other part of the fibre.

4,630,477

THERMISTOR LIQUID-LEVEL SENSING PROBE

James B. Murtland, Jr., 441 SE. 15th Ave., Pompano Beach, Fla. 33060

Filed Dec. 30, 1983, Ser. No. 567,162
Int. Cl.[4] G01F *23/24*
U.S. Cl. 73—295 **2 Claims**



2. A liquid-level indicating probe comprising an elongated body of plastic material having a longitudinally-extending bore therein which extends from the back of the body to a forward end closely adjacent the forward terminal end of the body without projecting through the forward end of the body, a thermistor inserted into said bore having electrical leads extending backwardly through said bore and having external leads connected within said body in blind bores of said body to said leads of said thermistor, said external and thermistor leads being sealed and embedded by epoxy material molded about said leads at points adjacent and external said body, and a thermally-conductive compound at the forward end of said bore and in thermal engagement with the forward end of said elongated body, said thermistor being in contact with said thermally-conductive compound.

4,630,478

LIQUID VOLUME SENSOR SYSTEM

Dennis Johnson, Saskatoon, Canada, assignor to Pakwa Engineering Ltd., Saskatoon, Canada

Filed Jun. 15, 1984, Ser. No. 620,966
Claims priority, application Canada, Jun. 23, 1983, 431065
Int. Cl.[4] G01F *23/14*
U.S. Cl. 73—299 **13 Claims**

1. Apparatus for determining the volume of liquid relative to a known reference temperature in a tank comprising:

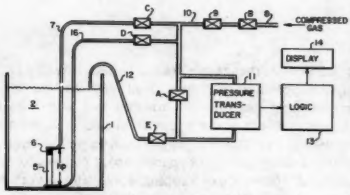
(a) first means for determining the pressure of the liquid at the bottom of the tank,

(b) second means for determining the pressure of the liquid at a height above the bottom of the tank,

(c) a first tube closed at one end, and closed at the other end by an expansion means, the tube being formed of material having a similar temperature coefficient of expansion as that of the tank, and being filled with a liquid having a temperature coefficient of expansion similar to that of the liquid in the tank, whereby the expansion means moves outwardly or inwardly axially of the tube with expansion or contraction of the tube and liquid in the tube,

(d) the first and second means being located such that upon immersion into the tank with said second means vertically above the first means, they are separated by the ends of the tube, their separation defining said height, and whereby with expansion of the expansion means, their separation changes,

(e) the expansion means being comprised of a bellows, individual first and second elongated tubes, means for disposing one end of one elongated tube at the end of said first tube, means for disposing one end of the other elongated tube at the end of the bellows opposite said first tube, and a third elongated tube, means for disposing one end of the



third elongated tube in the atmosphere just above the surface of the liquid, a source of compressed gas, means for applying the compressed gas to the first and second elongated tubes at pressures just balancing the liquid pressures at the bottom of the tank and at said height respectively, a differential pressure transducer, means for connecting inputs to the transducer to the third and first elongated tubes respectively to obtain a measure of the liquid pressure at the bottom of the tank relative to atmospheric pressure, means for connecting inputs to the transducer to the third and second elongated tubes respectively to obtain a measure of the liquid pressure at said height relative to atmospheric pressure, and means for providing an output signal from the transducer corresponding to said pressures, relative to atmospheric, whereby the pressure differential of the liquid at the locations of said first and second means can be determined as a parameter for obtaining an indication of the volume of liquid in the tank independently of the effects of expansion of the liquid and of the tank due to their temperature changes.

4,630,479

SAMPLING DEVICE FOR SOLIDS IN A PRESSURIZED REACTOR

Heinrich Wagener, Bochum; Reinhold Kirchhoff, Hattingen; Karl H. Van Heek, and Harald Jüntgen, both of Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed May 17, 1985, Ser. No. 735,415
Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418311
Int. Cl.[4] G01N *1/04*
U.S. Cl. 73—863.83 **9 Claims**

1. A sampling device for solids from a pressure reactor having a reactor wall, said sampling device comprising:

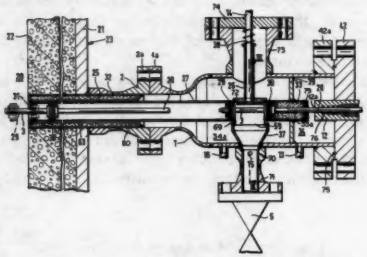
a housing connected to the reactor and defining an axis;

a tube in said housing extending through the reactor wall with one axial end opening into the reactor, said tube

being provided with an outlet opening in said housing between ends of said tube

a piston movable within said tube in an axial direction between a first position in which solids are withdrawn from the reactor and a second position in which said piston registers with said outlet opening;

discharge means connected to said opening of said tube for allowing solids drawn from the reactor by said piston to be removed from said tube and said housing; and



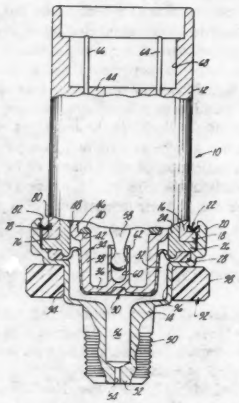
inlet and outlet means connected to said housing for providing a supply and discharge of at least one barrier flushing and cooling gas for said housing and said tube to block incursion of gas under pressure in said reactor, said piston including two spaced gas-permeable piston rings each of which has a plurality of spaced-apart plates and respective soft and elastic dust-trapping insulating layers arranged between each two successive plates of each of said rings.

4,630,480

TRANSDUCER FASTENING DEVICE

Joseph T. Betterton, Arab, and Alfred H. Glover, Decatur, both of Ala., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Nov. 12, 1985, Ser. No. 796,337
Int. Cl.[4] G01L 7/16, 19/14
U.S. Cl. 73—431 **4 Claims**



1. A pressure transducer having first and second housings connected together by an annularly shaped fastener means comprising:

a generally tubular first housing having a substantially cylindrical end portion with a radially outwardly extending edge flange adjacent thereto;

a generally tubular second housing having a substantially cylindrical end portion of greater diameter than the diameter of the edge flange of the first housing, the end portion of the second housing encircling the edge flange and the end cylindrical portion of the second housing encircling the edge flange and the end cylindrical portion of the first housing when the housings are assembled together in a telescopically arranged condition, whereby an open channel means extends between the cylindrical portion of the first housing and the encircling end portion of the second housing;

first groove means extending circumferentially in the outer surface of the first housing adjacent the edge flange thereof;

second groove means extending circumferentially in the inner surface of the end portion of the second housing, whereby the first and second groove means are axially aligned with respect to one another when the housings are arranged in the telescopically assembled condition;

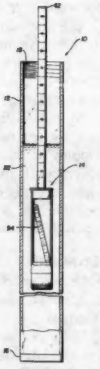
an annularly configured fastener means with a generally V-shaped cross section characterized by radially outwardly and inwardly projecting leg portions which extend from a common central portion, the fastener means being of resilient but stiff material to permit the inner and outer leg portions to distortingly flex toward one another when the fastener means passes into the channel means formed between the first and second housings and whereby the leg portions move toward their predistorted configuration into the groove means as the common central portion moves into close relationship with the flange of the first housing whereas the fastener means is wholly within the space defined by the first and second channel means.

4,630,481

METHOD AND INSTRUMENT TO ESTIMATE THE WEIGHTS OF GREEN TREES AND LOGS

Gary C. Bergstrom, Jacksonville, and Michael B. Lambert, Boring, both of Oreg., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 9, 1985, Ser. No. 764,040
Int. Cl.[4] G01G 5/02
U.S. Cl. 73—437 **13 Claims**



1. An instrument for determining the weight of a living or freshly cut tree, comprising a sample chamber and quill assembly, a float chamber to receive said sample chamber and quill assembly, a scale for preparing samples for use in said sample chamber and quill assembly, said samples comprising cores bored out of said living or freshly cut tree whose weight is to

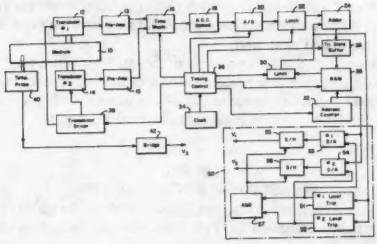
be determined and said cores being bored out of said tree transverse to the axis of said tree and at regular intervals along the length of the said tree and said cores being of a predetermined diameter, said scale comprising means to prepare said samples from said cores such that said samples will have a predetermined length so as to permit a sample so prepared to fit into said sample chamber and quill assembly and whereby a sample so prepared will have a predetermined volume, said scale comprising means to prepare said samples from said cores such that the ratio of heartwood to sapwood in said sample simulates that same ratio in the living or freshly cut tree at the height thereon at which the corresponding core was bored, and means to use the data produced by said instrument concerning all of said samples made from said cores bored at said regular intervals out of said tree to determine the weight of said tree.

4,630,482

METHOD AND APPARATUS FOR ULTRASONIC MEASUREMENTS OF A MEDIUM

John Traina, 303 N. Rose Dr., Glenshaw, Pa. 15116

Filed Jun. 17, 1985, Ser. No. 745,725
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—597 **22 Claims**



1. A method of ultrasonic measurement of a time taken by an ultrasonic tone burst to traverse a medium comprising the steps of:

(a) placing a first transducer, said first transducer being capable of emitting a first ultrasonic signal upon receipt of a first electric signal and generating a first output electrical signal upon receipt of a second ultrasonic signal;

(b) placing a second transducer at a distance from the first transducer, said second transducer being capable of emitting the second ultrasonic signal upon receipt of a second electrical signal and generating a second output electrical signal upon receipt of the first ultrasonic signal;

(c) emitting the first ultrasonic signal from the first transducer to the second transducer thereby producing a second output signal;

(d) checking the second transducer for the second output signal during sequential time slots along a chosen time interval;

(e) producing a sequence of input samples, one for each time slot, according the presence and strength of the output signal at each time slot;

(f) selecting an address in a memory which corresponds to each time slot;

(g) storing each input sample in memory at an address which corresponds to the time slot at which the input sample was taken;

(h) emitting from the first transducer additional ultrasonic signals;

(i) checking after emission at each additional ultrasonic signal the second transducer for an output signal at the sequential time slots along the previously chosen time interval;

(j) producing a subsequent sequence of input samples, one for each time slot according to the presence and strength of the output signal at each time slot;

(k) mathematically combining each subsequent sequence of input samples to the input samples stored in memory thereby producing a corresponding new processed sample at each address;

(l) examining each new processed sample as to its degree of enhancement with a threshold value; and

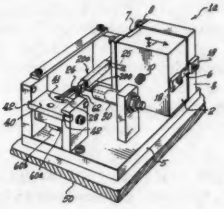
(m) measuring a traverse time by determining the time which corresponds time slot of the new processed sample which first reaches sufficient enhancement.

4,630,483

PEAK ACCELEROGRAPH

Paul D. Engdahl, 2850 Monterey Ave., Costa Mesa, Calif. 92626

Filed Jul. 24, 1985, Ser. No. 758,307
Int. Cl.[4] G01D *15/02*
U.S. Cl. 73—652 **8 Claims**



1. A peak accelerograph comprising an accelerograph element having

a base member and a proof mass each having generally parallel facing surfaces defining a clearance space therebetween,

parallel flat spring reeds connecting said base member and said mass to permit relative parallel oscillatory displacement therebetween,

said reeds being three in number;

a displacement-magnifying lever arm having a root portion, a push-rod portion, an arm portion, and a stylus-carrier portion;

a connection from said root portion to said base member and a connection from said push rod portion to said proof mass,

all said portions being integral parts of a single bent piece of sheet material,

said arm and push-rod portions having channel-shaped cross sections.

4,630,484

MASS FLOWMETER

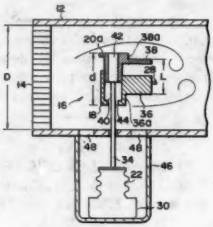
Toru Mizuno, Aichi; Sinzi Nanba, Kariya; Kazuma Matsui, Toyohashi, and Tsukasa Goto, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 29, 1985, Ser. No. 739,004
Claims priority, application Japan, May 31, 1984, 59-112301; Dec. 5, 1984, 59-256827; Dec. 5, 1984, 59-256828; Dec. 5, 1984, 59-256830
Int. Cl.[4] G01F *1/32*
U.S. Cl. 73—861.22 **16 Claims**

1. A mass flowmeter for measuring the mass flow of a fluid, comprising:

a vortex generator, which is placed in the flow of a fluid, for shedding a Karman vortex street downstream of the vortex generator, said vortex generator including a stationary member having a trough extending in a direction at right angles to the flow of the fluid and a movable member located inside said trough and including a bellows for expanding and contracting in response to changes in the

pressure and temperature of the fluid, the movable member being displaceable in a direction at right angles to the flow of the fluid to thereby vary a characteristic dimension of said vortex generator;



compensation means for displacing the movable member in relation to the stationary member in response to changes in pressure and temperature of the fluid to vary the characteristic dimension of said vortex generator; and

detection means for detecting Karman vortices generated downstream of said vortex generator.

4,630,485

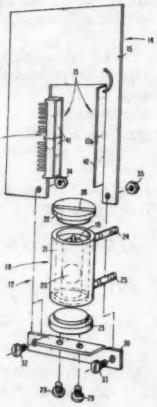
GAS OR LOW VOLUME LIQUID FLOW METER

Max Westl, Sr., Lafayette, Ind., assignor to Lafayette Instrument Co., Inc., Lafayette, Ind.

Filed Dec. 3, 1984, Ser. No. 677,543

Int. Cl.⁴ G01F *1/24*

U.S. Cl. 73—861.56 **9 Claims**



1. An apparatus for metering the volume of flow of a fluid, comprising:

a mechanical flow gage including,

(a) a housing having upper and lower portions and defining an inner flow chamber, the upper and lower portions of said housing respectively having output and input flow passages in flow communication with said chamber, said chamber including a cylindrical passageway having a first diameter and being further defined by a plurality of longitudinal slits in said housing, said slits extending outwardly of said cylindrical passageway and radially spaced apart, each of said slits having along at least a portion of their lengths a taper extending outwardly towards the upper portion of said housing such that the cross-sectional area of said chamber increases upwardly along the length of said tapered portions of said slits, and

(b) a spherically shaped float indicator received within said chamber and having a diameter slightly smaller than the cylinder diameter of said chamber, whereby, when the center of said indicator is positioned along the tapered portion of said slits, the flow rate of said fluid flowing through said chamber is directly linearly related to the upward displacement of said indicator;

a position detection means, associated with said flow gage but non-invasive with respect thereto, for detecting the positon of said indicator and providing an analog output which is responsive to the position of said indicator, said position detection means including a light emitting means and a light sensitive element oppositely positioned relative to said flow meter, said light sensitive element having a working surface facing said light emitting means which varies in electrical resistance in relationship to light cast upon its surface, said working surfaces aligned with said cylindrical passageway and said light emitting means, said light emitting means bathing said light sensitive element in a beam of light having a constant intensity throughout said working surface except when said float indicator is in a position which interferes with the passage of light between said light emitting means and said light sensitive element, wherein the resistance across said light sensitive element varies linearly with the vertical displacement of said float indicator along the length of said tapered portions of said slits; and

an analog to digital conversion means for converting the analog output from said position detection means into a digital output representative of the accumulative volume of fluid flow through said mechanical flow gage.

4,630,486

MEASURING INSTRUMENTS

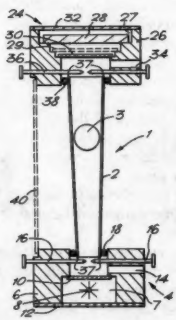
James J. Miles, Birch Vale, and John M. Smith, Keighley, both of England, assignors to The BOC Group, Inc., Montvale, N.J.

Filed May 20, 1985, Ser. No. 735,906

Claims priority, application United Kingdom, May 22, 1984, 8413048

Int. Cl.⁴ G01F *1/24*

U.S. Cl. 73—861.56 **7 Claims**



1. A device for measuring the flowrate of a fluid comprising a tube having a tapered bore for the passage therethrough of the fluid, a float freely movable along the length of the tube, means for producing a beam of electromagnetic radiation within and along the tube diverging at an angle substantially the same as the tapered divergence of said bore and a sensor for detecting electromagnetic radiation emitted by said means axially along the tube, the arrangement being such that, for a given flowrate of fluid through the tube, the float will take up

a corresponding position in the bore of the tube thereby determining the amount of electromagnetic energy reaching the sensor from the source.

4,630,487

FLOW RATE METER

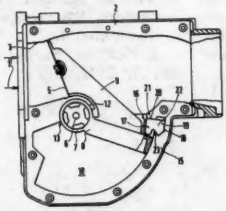
Eberhard Biermann, Uhldingen; Erwin Nägele, Hessigheim, and Peter Romann, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 25, 1985, Ser. No. 695,033

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3414012

Int. Cl.[4] G01F *1/28*

U.S. Cl. 73—861.76 3 Claims



1. A flow rate meter having a housing and a flow conduit embodied in the housing, an air flow measuring body disposed in said flow conduit and pivotable counter to a restoring force about a bearing shaft supported in said housing in accordance with a quantity of medium flowing through said flow conduit, a damping chamber including a wall, a damping body coupled with said air flow measuring body and pivotable about said bearing shaft in said damping chamber, said damping body having a form of a movable wall defining said damping chamber with respect to said flow conduit, in which a pivoting movement of said damping body within said damping chamber toward the flow conduit is limited by means of an elastic stop body supported on said damping chamber wall outside said flow conduit between said damping body and said flow conduit, said stop body includes a retaining section which form-fittingly engages a retaining groove in said damping chamber wall, and a stop section which protrudes into said damping chamber.

4,630,488

SINGLE JET LIQUID METER

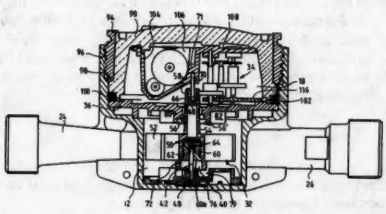
Alain Marlier, Lugny, and Henri Oszajca, Macon, both of France, assignors to Flonic, Montrouge, France

Filed Jun. 26, 1985, Ser. No. 749,032

Claims priority, application France, Jun. 28, 1984, 84 10212

Int. Cl.[4] G01F *1/07, 1/08*

U.S. Cl. 73—861.81 13 Claims



1. A single jet liquid meter comprising: a cylindrical measuring chamber having first and second end walls perpendicular to the axis of said chamber; an injector and an ejector in communication with said measuring chamber; a turbine having a hub and plurality of blades fixed to said hub, said hub having first and second end faces disposed opposite said first and second end walls respectively; means for guiding the said turbine in rotation about the axis of said chamber; a set of radiating ribs fixed to said first end wall and projecting into said chamber; the meter including the improvement whereby it further comprises an assembly constituting an axial stop disposed adjacent said first end face and constituted by a pivot having a tapering point and an abutment which is in contact with said point when the liquid flow rate is zero, means for subjecting said second end face to a pressure reduction effect produced by rotation of said liquid in said chamber, and means for protecting said first end face from said reduced pressure effect at low speeds of rotation of said turbine, in such a manner that the turbine moves axially to take said point out of contact with said abutment, and to subject said first end face to said pressure reduction phenomenon from a given axial displacement of said turbine, such that said turbine is fixed axially under the reduced pressure effect which is applied to both of said end faces.

4,630,489

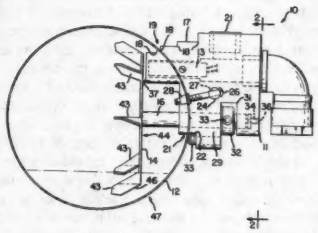
FLOW SENSOR FOR PARTICULATE MATERIAL

Glen W. Fisher, 708 - 99th SE., Bellevue, Wash. 98004; Lionel C. Helweg, 640 SW. 124th St., Seattle, Wash. 98146, and Rick S. Jones, 5030 51st Ave. SW., Seattle, Wash. 98136

Filed Aug. 16, 1984, Ser. No. 641,382

Int. Cl.[4] G01F *1/06*

U.S. Cl. 73—861.87 12 Claims



1. An apparatus for sensing the flow of particulate material comprising a paddle wheel having a plurality of radially spaced blades for engaging a stream of particulate material.

each of the blades of said paddle wheel including generally linear outer edge;

mounting means for rotatably mounting said rotor means such that it rotates when it contacts a stream of flowing particulate material; a generally cylindrical housing for receiving a flow of particulate material to which said housing is connected such that said paddle wheel is positioned within said housing to contact a flow of particulate material therein, and

such that, when each blade is moved to its lowest rotational position, the outer edge thereof is generally parallel to a line tangent to the adjacent wall of the housing;

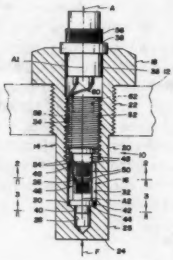
and means operatively associated with said rotor means for sensing rotation of said rotor means and producing an output signal in response to such rotation.

4,630,490

COMPRESSION STRAIN GAUGE TRANSDUCER ASSEMBLY

Raymond W. Malicki, Dearborn Heights, Mich., assignor to Carron & Company, Inkster, Mich.

Filed Jul. 12, 1985, Ser. No. 754,623
Int. Cl.[4] G01L 1/22; G01B 7/18
U.S. Cl. 73—862.65 3 Claims



1. A compression strain gauge transducer assembly comprising: a sensing member including a head and a shank extending from the head along a central axis of the sensing member; said shank having threads for mounting the sensing member and having a distal end at which the shank is loaded in compression; a counterbored hole extending through the head of the sensing member into the shank thereof along the central axis; said counterbored hole including an inner pilot end, an annular seat of a flat shape extending radially outward from the inner pilot end in a perpendicular relationship to the central axis, an intermediate portion extending axially outward from the annular seat, and a threaded outer portion; a strain gauge transducer received within the counterbored hole of the sensing member and having a central axis coaxial with the central axis of the counterbored hole in the sensing member; said transducer including an inner pilot received within the inner pilot end of the counterbored hole to locate the transducer; an annular seat on the transducer extending radially outward from the inner pilot thereof and having a flat shape extending perpendicular to the central axis thereof in engagement with the annular seat of the counterbored hole in the sensing member; an intermediate portion of the transducer extending axially outward from the inner pilot thereof and having four outer surfaces defining a square cross section; at least two strain gauges each of which is mounted on an associated outer surface of the square intermediate transducer portion; the transducer including a threaded outer portion connected to the intermediate portion thereof and threaded into the threaded outer portion of the counterbored hole in the sensing member to maintain an engaged relationship of the annular seats; and wires extending from the strain gauges to permit sensing of compression loading applied to the distal shank end of the mounted sensing member.

4,630,491

LOAD CELL AND METHOD OF COMPENSATING THE SAME

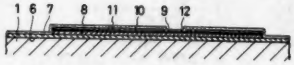
Tohru Kitagawa; Koichiro Sakamoto, and Yasuhiro Ushijima, all of Mishima, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1985, Ser. No. 721,408
Claims priority, application Japan, Apr. 9, 1984, 59-70480
Int. Cl.[4] G01L 1/22
U.S. Cl. 73—862.67 4 Claims

1. A method of compensating a load cell which comprises the steps of:

laminating layers of thin metal films to form strain gage resistor portions, lead portions for bridge coupling of said resistor portions and compensating portions,

forming a pigmented protection film on said thin metal films, and



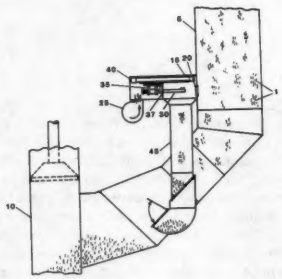
applying laser trimming to the thin metal films from above the protection film, whereby energy absorbtion is enhanced in said laser trimming step.

4,630,492

AUTOMATIC STAPLE FIBER SAMPLER

Sidney H. Goode, Spartanburg, S.C., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Dec. 2, 1985, Ser. No. 803,362
Int. Cl.[4] G01N 1/02
U.S. Cl. 73—863.82 19 Claims



1. An apparatus for sampling staple fibers which are falling within a fiber chute comprising

(i) a sampler housing;

(ii) means for attachment of said sampler housing to a sample port on said fiber chute;

(iii) means for maintaining the air pressure within said sampler housing substantially equivalent to the air pressure within said fiber chute;

(iv) a sample discharge chute attached to said sampler housing;

(v) a rod-like sample probe mounted within said sampler housing having a smooth, convex fiber-sampling section at one rounded end and, opposite thereto, a mounting means engagement end, said fiber-sampling section having at least one protrusion mounted at or near said rounded end;

(vi) means for retractably inserting said rod-like sample probe from within said sampler housing into said fiber chute perpendicularly to the direction of fiber travel;

(vii) means for rotating said rod-like sample probe more than 90 degrees about its major axis from a first, fiber-sampling position to a second, fiber-discharging position;

(viii) means for controlling the movements of said rod-like sample probe by the retractable insertion means and the rotation means.

4,630,493

CAM ARRANGEMENT

Heizaburou Kato, Ichikawa, Japan, assignor to Sankyo Manufacturing Company, Ltd., Tokyo, Japan

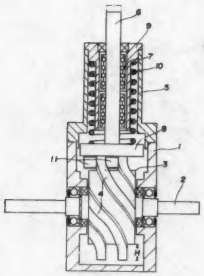
Filed Mar. 13, 1984, Ser. No. 589,668
Int. Cl.[4] F16H 37/16
U.S. Cl. 74—22 R 3 Claims

1. A cam arrangement comprising:

a housing;

an input shaft rotatably mounted on said housing;

a solid cam having a central portion fixed to said input shaft and having a plurality of ribs formed on a circumferential surface thereof and spaced from each other, said solid cam being formed to a non-circular configuration at an outer periphery of said ribs, said ribs including a linear portion extending in a circumferential direction and an inclined portion inclined in a lateral direction with respect to said circumferential direction;



an output shaft extending in perpendicular relationship to said input shaft and mounted for rotational movement and also for movement in opposite axial directions;

a spider fixed to an end of said output shaft and maintained in contact with said outer periphery of said ribs of said solid cam;

a plurality of cam followers mounted on said spider, each said cam follower being guided between an adjacent pair of said ribs; and

means for resiliently pressing said spider into continuous contact with said outer periphery of said ribs.

4,630,494

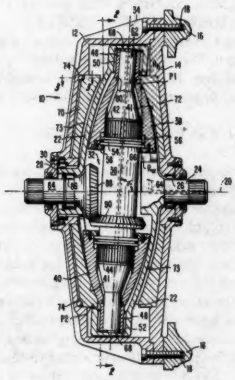
RADIALLY ORIENTED NUTATIONAL TRACTION DRIVE TRANSMISSION

Yves J. Kemper, 1371 Kirkway Rd., Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 705,647, Feb. 26, 1985, abandoned, and a continuation-in-part of Ser. No. 694,964, Jan. 25, 1985, abandoned. This application Apr. 18, 1985, Ser. No. 724,746

Int. Cl.[4] F16H *15/44, 15/16*

U.S. Cl. 74—191 **23 Claims**



1. In a continuously variable traction drive transmission having a frame, an alpha body supported by said frame for rotation about a first axis, a beta body supported by said alpha body on a second axis intersecting said first axis at a point of axes intersection and at an acute angle of axes intersection, said beta body having a pair of members on opposite sides of said point of axis intersection for defining beta rolling surfaces of revolution about said second axis, omega body means for defining a pair of omega rolling surfaces of revolution about said first axis, said beta and omega surfaces being in rolling friction engagement at two points of contact in a plane containing said first and second axes, said two points of contact being located on opposite sides of said first axis and on opposite sides of said second axis, and means for varying the radius ratio of said beta and omega surfaces at said points of contact, the improvement comprising:

means for defining said alpha, beta and omega bodies so that said points of contact always lie within said acute angle between said first and second axes.

4,630,495

VARIABLE RATIO POWER TRANSMISSION MEANS

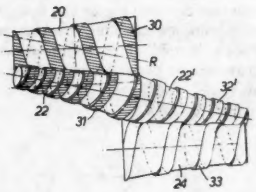
John D. Smith, Bristol, England, assignor to Fairey Hydraulics Limited, Hounslow, England

Filed Feb. 9, 1983, Ser. No. 465,085

Claims priority, application United Kingdom, Feb. 11, 1982, 8204040

Int. Cl.[4] F16H *15/44, 15/16*

U.S. Cl. 74—191 **19 Claims**



1. A rolling member for use in a continuously variable power transmission, the rolling member comprising a truncated cone having a concave circumferential surface, generated about an axis substantially parabolic in axial section and having a substantially straight rolling contact line extending along substantially the length of the surface and disposed at a compound angle with respect to the axis, whereby rolling contact may be made with an equivalent straight rolling contact line of a similarly configured cone.

4,630,496

BACKLASH CORRECTING DEVICE FOR SWIVEL ARM OF ROBOT

Hirotoshi Yasuoka, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1985, Ser. No. 696,553

Claims priority, application Japan, Jan. 30, 1984, 59-13428

Int. Cl.[4] F16H *55/18*

U.S. Cl. 74—409 **10 Claims**

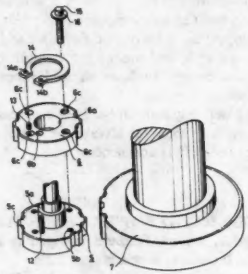
1. A swivel shaft backlash correcting device for a robot, comprising:

a gear shaft, a spur gear mounted at one end of said shaft and having first and second axial surfaces and a plurality of threaded axial holes, said spur gear further having an axially-extending first pin having a predetermined length fixed to said first axial surface of said spur gear, said shaft being coupled through a speed reducer to an electric motor;

a correcting gear having first and second axial surfaces and disposed with its second axial surface facing said first axial surface of said spur gear, said correcting gear having an

axial through-hole through which said first pin extends, a plurality of additional through-holes in alignment with said threaded axial holes in said spur gear and an axially-extending second pin having a predetermined length, said correcting gear having the same diameter and number of teeth as said spur gear;

a retaining ring disposed adjacent said first axial surface of said correcting gear and engaged with said first and sec-



ond pins in a contracted or compressed state of said retaining ring to apply a force of expansion to said gear shaft and said correcting gear;

a center gear fixedly secured to a stationary stand and engaged with said correcting gear and said spur gear; and

a plurality of bolts for extending through said additional through-holes in said correcting gear and threadedly engaging respective ones of said threaded holes in said spur gear.

4,630,497

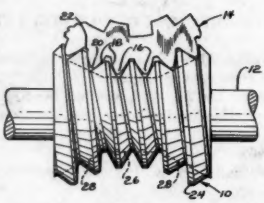
TAPERED WORM

Bertel S. Nelson, Naperville, Ill., assignor to Wedgtrac Corporation, Yorkville, Ill.

Filed Nov. 5, 1984, Ser. No. 668,196

Int. Cl.⁴ F16H *1/16, 1/20, 55/17, 55/22*

U.S. Cl. 74—425 **5 Claims**



5. A worm and a worm gear meshing therewith, said worm gear having a plurality of teeth, said worm comprising a substantially cylindrical portion, and a pair of tapered frustoconical portions at each end of said cylindrical portion, and a thread extending over said substantially cylindrical portion and both of said tapered portions, the thread on both said cylindrical portions and on said tapered portions being simultaneously in driving engagement with the teeth of said gear.

4,630,498

LAMINATED WHEEL ASSEMBLY

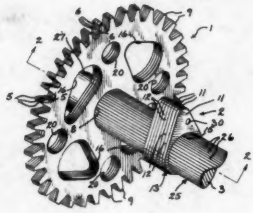
John D. Santi, Milwaukee, Wis., assignor to Briggs & Stratton Corp., Wauwatosa, Wis.

Continuation-in-part of Ser. No. 403,465, Jul. 30, 1982. This application Jan. 23, 1985, Ser. No. 694,106

The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.

Int. Cl.⁴ F16H *55/12;* **B21D** *53/28;* **F16G** *11/00;* **F16B** *3/00*

U.S. Cl. 74—445 **6 Claims**



1. A wheel assembly, comprising:

a rotatable shaft;

a pair of wheels fixedly secured to said shaft and disposed in axially spaced relation to one another, each of said wheels including a laminated stack of flat plates disposed in abutting relation to one antoehr, each of said plates having an opening formed therethrough disposed in axial registry for frictionally receiving said shaft, one of said wheels includes intergral teeth formed in its periphery to provide a laminated gear and the other wheel includes an integral cam surface formed in its periphery to provide a laminated cam, and each of the individual plates of said cam is stamped from the individual plates of said gear; and

means for mounting said wheels on said shaft, said mounting means includes a serrated outer surface on said shaft having a plurality of axially extending, radially projecting teeth disposed circumferentially about substantially the entire outer surface of said shaft, said teeth being tapered along their axial length so that their radially outer diameter at one end of said shaft is less than their radially outer diameter at the other end of said shaft to secure said wheels aginst both axial and circumferential movement relative to said shaft by virtue of the interference of said teeth with said wheels.

4,630,499

SELECTOR MECHANISM FOR AN AUTOMATIC TRANSMISSION VEHICLE

Allan S. Hopkins, Coventry, United Kingdom, assignor to Jaguar Cars Limited, West Midlands, England

Filed Jan. 25, 1985, Ser. No. 694,824

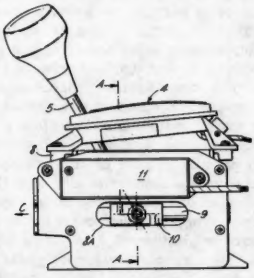
Claims priority, application United Kingdom, Jan. 27, 1984, 8402164

Int. Cl.⁴ B60K *20/00;* **G05G** *9/00*

U.S. Cl. 74—473 R **13 Claims**

1. A selector mechanism for an automatic transmission comprising in combination a longitudinally movable operating member for operative attachment to an automatic gearbox, a control lever pivotable about a first, transverse, axis and a second, longitudinal, axis and arranged to control movement of the operating member, guide means for said control lever defining first and second generally longitudinally extending paths, an interconnection between the paths at one end of each path such that the paths extend generally in the same direction from said interconnection, a first driving means and a second driving means each operatively connected to the control lever on opposite sides of said first axis such that generally longitudinal movement of the control lever along one of said first and second paths produces corresponding movement of said first

and second driving means in mutually opposite generally longitudinal directions, a first driven means and a second driven means operatively connected to said operating member, said first driving means being moved into operative engagement with said first driven means in response to positioning said control lever in said first path and said second driving means being moved into operative engagement with said second



driven means in response to positioning said control lever in said second path whereby movement of the control lever from a position remote from the interconnection on the first path, along said first path towards said interconnection causes movement of the operating member in one direction and thereafter movement of the control lever along said second path away from said interconnection causes further movement of the operating member in the same direction.

4,630,500

TRANSMISSION OPERATING DEVICE

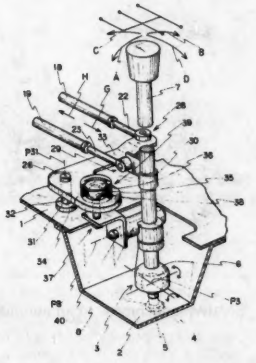
Kazuhiro Suzuki, Nishinomiya, Japan, assignor to Nippon Cable System Inc., Takarazuka, Japan

Filed Jul. 24, 1985, Ser. No. 758,612

Claims priority, application Japan, Jun. 14, 1985, 60-130341

Int. Cl.[4] G05G *9/16, 9/02*

U.S. Cl. 74—473 R **4 Claims**



1. A transmission operating device comprising:

(a) a frame;

(b) a first ball joint provided on a lowered portion of the frame;

(c) a change speed lever supported on the frame by means of the first ball joint;

(d) a first control cable and a second control cable extending in the plane crossing with an axis of the change speed lever and being arranged substantially parallel to each other;

(e) a bell crank being provided on the frame so as to rotate around a first axis extending substatially parallel to the change speed lever and having a first arm extending in the direction crossing with the first control cable and a second arm extending substantially parallel to the second control cable; and

(f) a connecting link of which one end is connected with the change speed lever so as to rotate around a second axis crossing with the axis of the change speed lever, and of which the other end is connected with the second arm by means of a second ball joint, and extending in the direction crossing with the second arm,

wherein one end of the first control cable is connected with the first arm, and one end of the second control cable is connected with the change speed lever.

4,630,501

STEERING SWITCH PAD APPARATUS

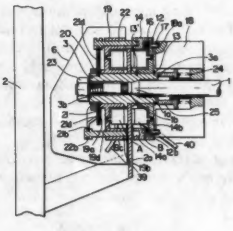
Kazuhisa Kubota, and Takafumi Ichikawa, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Oct. 29, 1984, Ser. No. 665,876

Claims priority, application Japan, Oct. 28, 1983, 58-167106[U]; Dec. 29, 1983, 58-204077[U]; Dec. 29, 1983, 58-204078[U]; Dec. 29, 1983, 58-204079[U]

Int. Cl.[4] B62D *1/04, 1/16*

U.S. Cl. 74—484 R **6 Claims**



1. A steering wheel switch pad apparatus for mounting on a boss at the steering wheel end of a steering shaft and within the circumference of the steering wheel, said steering wheel being mounted on a boss plate fixed to said boss inward of said end of said shaft, said boss being fixed to said steering shaft for turning said steering shaft when said boss and said boss plate are turned by said steering wheel, said switch pad apparatus comprising:

a cam plate fixed to the end of said boss adjacent said steering wheel end of said shaft for rotation with said boss when said boss and said steering shaft are turned by said steering wheel;

a pin holder mounted on said boss intermediate said cam plate and said boss plate, said pin holder having at least two pin guide holes extending therethrough in substantial alignment with the axis of said steering shaft, each of said pin holes having a pin therein for axial movement therethrough, each of said pins having means at one end of said pin extending outwardly from the cam plate end of said pin holder for engaging said cam plate and means at the other end for projecting axially beyond the rotating path of said boss plate when said pin is advanced by said cam plate and for retracting axially out of said rotating path of said boss plate when said pin is retracted by said cam plate; and

a base having pin guide holes therein aligned with said pin guide holes in said pin holder, said base being mounted on said boss at the side of said boss plate opposite to the side of said boss plate where said pin holder is mounted and said cam plate is fixed to said boss, said pin guide holes in said base receiving the ends of said pins projecting axially

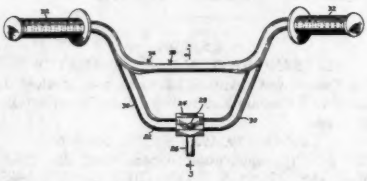
beyond the rotating path of said boss plate by said cam plate when said boss and said boss plate are rotated by the turning of said steering wheel to hold said projecting pins and said pin holder from rotating as said boss and boss plate are turned by said steering wheel.

4,630,502

FLAT CROSS BAR FOR FREESTYLE BICYCLE HANDLEBAR

Mark Greco, Kenosha, Wis., assignor to Schwinn Bicycle Company, Chicago, Ill.

Filed Sep. 4, 1985, Ser. No. 772,552
Int. Cl.[4] B62K *21/12*
U.S. Cl. 74—551.1 **4 Claims**



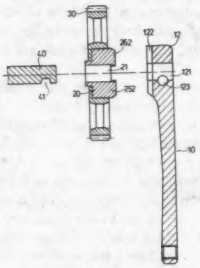
1. A handlebar for a bicycle comprising in combination:
a horizontal tubular mid section adapted to be connected to the stem of a bicycle fork;
a pair of diverging arms extending upwardly from opposite ends of said tubular mid section and having handle members extending outwardly from the ends of said arms;
a horizontal cross bar connecting said arms at a level intermediate the levels of said tubular mid section and said handle members;
said tubular mid section, arms and cross bar being coplanar in an upright plane: and
a flat upper surface on the cross bar to support a rider to facilitate performing freestyle maneuvers.

4,630,503

PEDAL LINK ASSEMBLY FOR BICYCLE

King Liu, 19, Shun-Fan Road, Ta-Cha Town, Taichung Hsien, Taiwan

Filed Oct. 4, 1985, Ser. No. 784,102
Int. Cl.[4] G05G *1/14*
U.S. Cl. 74—594.2 **1 Claim**



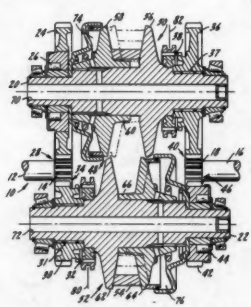
1. A transmission mechanism comprising: a crank member having a screw opening at one end for making connection with a pedal-like element, and a head portion formed at another end, said head portion having a horizontal penetrating hole, an open slot vertically provided across said penetrating hole, and a pin hole horizontally formed in another side with a central axis tangentially crossing a lower periphery of said penetrating hole; a plastic-moulded transmission means having a central through opening connected to said head portion through said open slot with the through opening aligned with said penetrating hole; a transmission linking unit with an arcuate notch longitudinally formed at one end disposed in the aligned through opening and penetrating hole with the arcuate notch located in line with said pin hole; and a push pin member connected in said pin hole and securing said plastic-moulded transmission means and said transmission linking unit in firm position against the head portion of said crank member; whereby, said plastic-moulded transmission means mounted on the head portion of said crank member is always centered during rotation of the transmission mechanism, wherein said plastic-moulded transmission means comprises: an inside gearing member having an annular body portion, a central through opening formed in the body portion with a diameter similar to that of said penetrating hole of said crank head portion, a circular flange with a diameter smaller than that of the body portion located around a lower end of the through opening, a pair of side pieces opposing each other on the body portion at a pedetermined height thereof, a pair of L-shaped positioning lugs each having a vertical portion integrated with the body portion and extend in perpendicular direction to said side pieces, and each having a horizontal portion respectively curving over and integrated with an upper edge of the body portion; and a plastic transmission gear member disposed around the periphery of the annular body portion of said inside gearing member through an injection moulding operation with wear-resistant plastic material, so that said plastic transmission gear member and said inside gearing member are incorporated into a single solidified transmission unit which generates no noise and does not wobble and become loose from said crank member during rotation.

4,630,504

DUAL-PASS CONTINUOUSLY VARIABLE TRANSMISSION

Richard L. Smirl, Arlington Hts., Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 22, 1985, Ser. No. 768,294
Int. Cl.[4] F16H *11/02, 37/06;* F16D *41/04, 47/04*
U.S. Cl. 74—689 **7 Claims**



7. A multi-pass continuously variable transmission comprising rotatable input and output shafts; first and second rotatable intermediate shafts; a variator; drive means having one-way clutch means engageable for completing a first drive path extending in one direction from said input shaft through said first intermediate shaft, variator, and second intermediate shaft to said output shaft; and other drive means having clutching means engageable for completing a second drive path extending in one direction from said input shaft through said second intermediate shaft, variator, and first intermediate shaft to said output shaft; said second drive path also extending in the opposite direction from said output shaft through said first interme-

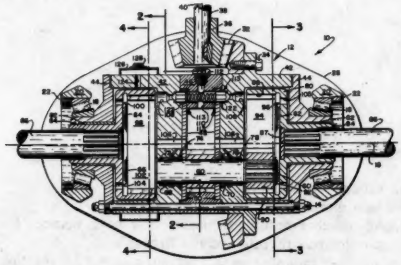
diate shaft, variator, and second intermediate shaft to said input shaft; said other drive means also having other one-way clutch means engageable for completing said second drive path extending in said opposite direction; said other one-way clutch means being engageable upon disengagement of said one-way clutch means when said clutching means is disengaged.

4,630,505

HYDRAULIC-CONTROLLED DIFFERENTIAL

Archie O. Williamson, 5916 S. Halifax Ave., Edina, Minn. 55424

Filed Oct. 24, 1985, Ser. No. 791,101
Int. Cl.[4] F16H *1/44*
U.S. Cl. 74—711 **12 Claims**



1. A hydraulic-controlled differential, which comprises:
a case supported for rotation about a transverse axis, said case defining a central chamber and two opposite side chambers;
means for effecting rotation of said case;
a rotatable output shaft extending outwardly from each side chamber of said case along the transverse axis;
at least two control gears supported for rotation in the central chamber of said case, said control gears and the central chamber of said case defining a gear pump with adjacent gears being intermeshed for rotation in opposite directions;
means extending between the central chamber and the side chambers of said case for drivingly connecting said control gears with the respective output shaft;
the side chambers in said case being fluidly connected for fluid level and pressure equalization between the side chambers; and
control valve means connected between each side chamber and the central chamber of said case adjacent intermesh of said control gears for limiting maximum fluid flow rate between the chambers to effect hydraulic modulation during differential drive of said output shafts.

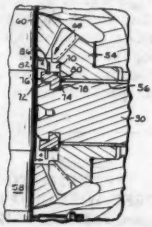
4,630,506

DRIVE AXLE AND METHOD OF ASSEMBLING SAME

Donald D. Allmandinger, and Richard L. Pifer, both of Fort Wayne, Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 6, 1984, Ser. No. 679,004
Int. Cl.[4] F16H *1/40*
U.S. Cl. 74—713 **12 Claims**

1. In an axle assembly, the combination comprising:
a differential cage,
a pair of side gears disposed in said cage, each side gear having a splined opening,
a pinion shaft mounted in said cage,
a pair of pinion gears rotatably journaled on said pinion shaft and meshing with said side gears,
a ring gear fastened to said cage and disposed to at least partially overlie said pinion shaft so that said pinion shaft cannot be removed from said cage after said ring gear is fastened to said cage,
a splined axle shaft having a groove adjacent one end, said axle shaft being disposed to extend through and engage the splined opening in one of said side gears so that said one end is adjacent said pinion shaft,



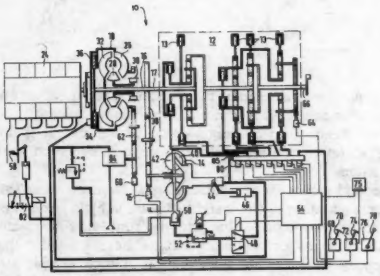
a plurality of separate and independent retainer ring segments disposed in said groove and engaging the adjacent side gear, and
means resiliently holding said segments in said groove.

4,630,507

DRIVE SYSTEM WITH FLOW BRAKE

Artur Kugler, Augsburg; Rudi Reppert, Fussen, and Franz-Xaver Zaunberger, Augsburg, all of Fed. Rep. of Germany, assignors to Zahnraderfabrik Renk Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Jun. 6, 1984, Ser. No. 617,971
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1983, 3321948
Int. Cl.[4] F16H *47/04*; B60K *41/28*
U.S. Cl. 74—733 **10 Claims**



1. A vehicle drive system for improved braking efficiency, the system comprising a torque converter adapted to be driven by an engine, a speed change gear, control means for downshifting the speed change gear at least one speed during a braking cycle, the speed change gear including primary rotative input means, means drivingly interconnecting the torque converter and the primary input means, a bypass clutch, the bypass clutch being engaged to provide a direct drive coupling between the engine and the primary input means, control means for disengaging the bypass clutch to permit torque converter slip between the engine and the speed change gear during a braking cycle, a flow brake, the flow brake including a rotor, gear train means drivingly interconnecting the rotor and the primary input means, control means for applying the flow brake during a braking cycle, drive system further including a mechanical vehicle brake, control means for variably engaging the mechanical vehicle brake, electronic processor

means for automatically actuating the speed change control means, the bypass clutch control means and the flow brake control means during a braking cycle, the electronic processor means including means for automatically reducing but not eliminating the flow brake braking moment during speed change gear shifting to avoid shifting shocks, the electronic processor means further including means for preventing excessive engine speed during a braking cycle, the preventing means including means for monitoring the engine speed and in response to a predetermined monitored speed reducing the engine speed by actuating the mechanical vehicle brake control means to increase the braking moment of the mechanical vehicle brake or actuate the speed shift control means to upshift the speed change gear.

4,630,508

METHOD AND APPARATUS TO DETERMINE CONSTANT SPEED TORQUE ON AN ENGINE

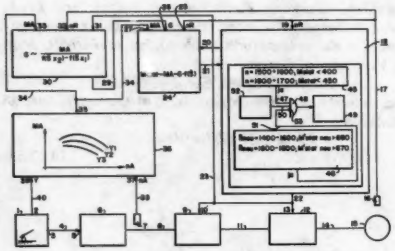
Alfred Klatt, Wathlingen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Mar. 16, 1984, Ser. No. 590,247

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1983, 3311254; Mar. 28, 1983, 3311295; Mar. 28, 1983, 3311306; Apr. 23, 1983, 3314800

Int. Cl.⁴ B60K *41/06*

U.S. Cl. 74—866 **56 Claims**



1. An apparatus to determine the constant speed drive torque of a vehicle engine, said apparatus comprising:

(a) a first means for providing a signal having a value that is representative of a momentary drive torque of such vehicle engine;

(b) a second means for providing a signal having a value that is representative of the weight of such vehicle connected to receive said signal value directly from said first means;

(c) a third means for providing a signal having a value that is representative of the acceleration of such vehcile at a preselected time and under preselected driving conditions connected to transmit said signal value directly to said second means;

(d) a fourth means for generating a signal having a value that is representative of a constant speed drive torque of such vehicle engine, said signal generating fourth means connected to receive said signal value directly from said first means and said signal value directly from said second means and said signal value directly from said third means, said signal generating fourth means determining said constant speed drive torque by subtracting the product of said weight representative signal value and said acceleration representative signal value from the value of said momentary drive torque representative signal and generating said signal value that is representative of said constant speed drive torque; and

(e) a fifth means connected to receive said signal value directly from said fourth means for controlling such vehicle in response to said constant speed drive torque representative signal.

4,630,509

ARTICULATED ASSEMBLY OF MEMBERS

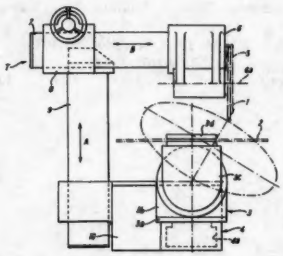
Joseph G. McLean, 'Crest Nook', 7A Ridge Avenue, Marple, Stockport, Cheshire, United Kingdom

Filed Mar. 21, 1984, Ser. No. 591,990

Claims priority, application United Kingdom, Mar. 26, 1983, 8308385; Oct. 21, 1983, 8328255

Int. Cl.⁴ B23D *63/14*

U.S. Cl. 76—37 **13 Claims**



1. An articulated assembly, comprising:

a first base member;

a second member mounted on said first base member for rotation relative thereto about a first axis;

a third member mounted on said second member for rotation relative thereto about a second axis; and

a fourth member mounted on said third member for rotation relative thereto about a third axis, said fourth member having an outer surface with means for mounting a tool or workpiece,

said first and third axes being co-axial and said first, second and third axes being co-planar when said first and second members are in at least a first relative position, said first and third axes being perpendicular and said first, second and third axes being co-planar when said first and second members are in at least a second relative position, said second axis being inclined relative to said first and third axes at an angle of substantially 45°, said axes intersecting at a common point throughout the range of angular movement of said members, said common point lying outside said fourth member and adjacent to and spaced from said outer surface.

4,630,510

TACTILE ENGAGING WRENCHING MECHANISM

Victor Belanger, Huntington Beach, Calif., assignor to Monogram Industries, Inc., Culver City, Calif.

Filed May 10, 1984, Ser. No. 608,765

Int. Cl.⁴ B25B *13/50*

U.S. Cl. 81—55 **20 Claims**

1. A tactile engaging wrenching tool adapted for use in the installation of a fastener to fasten a plurality of structures together, said fastener including a nut having a nut head with a surface for engagement with said wrenching tool and a screw having a wrench portion for engagement with said tool, said fastener being installed to fasten said structures together by inserting said fastener into a common opening in said structures and turning said screw relative to said nut to thereby deform said fastener in such a manner so as to fasten the structures together, said wrenching tool comprising:

a wrench adapter having a bottom end and a top end;

means associated with said wrench adapter bottom end for engaging the wrench portion of said screw to provide common only rotation of said screw and wrench adapter;

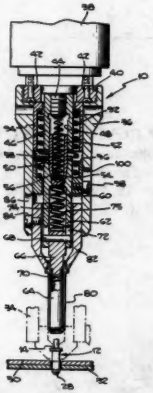
drive means for rotating said wrench adapter with sufficient torque to rotate said screw when said wrench adapter is engaged with the wrench portion of said screw and said nut is held stationary;

first connection means for connecting said drive means to said wrench adapter, said first connection means including a clutch assembly which provides common rotation of said drive means and said wrench adapter when said wrench adapter is engaged with said screw except when said nut is held stationary, said clutch assembly providing rotation of said drive means relative to said screw when said nut is held stationary and said wrench adapter is engaged with said screw so that said screw does not rotate relative to said nut;

a nose-piece having a bottom end and a top end;

means associated with said nose-piece bottom end for engaging said nut to hold said nut stationary and prevent rotation of said nut;

means for biasing said nose-piece bottom end against said nut head; and



second connection means for directly connecting said drive means to said wrench adapter and overriding said clutch assembly, said second connection means providing torquing of said wrench adapter by said drive means sufficient to turn said screw relative to said stationary nut head when said wrench adapter is engaged with said screw and said nose-piece is engaged with said nut head to deform said fastener to fasten said structures together, said second connection means being operable to provide the direct connection between said wrench adapter and said drive means only when said nose-piece is biased against said nut head by said nose-piece biasing means to thereby provide positive engagement of said nose-piece with said nut head prior to direct connection of said drive means to said wrench adapter.

4,630,511

LUG WRENCH SUPPORT TOOL

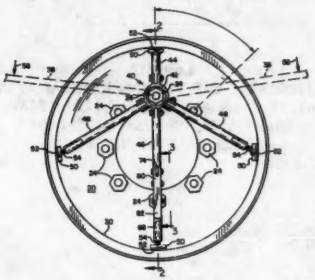
Chester L. Shirley, Rt. 1, Box 49-D, Elgin, Oreg. 97827

Continuation of Ser. No. 632,862, Jul. 20, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 831,053

Int. Cl.[4] B25B *23/00*

U.S. Cl. 81—462 **4 Claims**

1. A lug wrench support tool for removing lug nuts located inside a wheel well having a peripheral wall defining a circle with a defined inside diameter, said support tool comprising; a containment ring and four leg members coupled together, said leg members radially extended to terminate at spaced radially directed positions, which positions define a circle equal to the diameter of the circle defined by the wheel well, one of said legs including first and second leg segments axially slideable relative to each other, a toggle mechanism including a pair of pivotally connected links, one of the links connected to one leg segment and the other link connected to the other leg segment, said links being relatively pivotable between a first position for shortening the overall length of the leg segments and a second position for lengthening the overall length of the leg segments and thereby extending said one leg to engage the periphery of said defined circle, said lug wrench containment ring being a



fully enclosed circle closely matching the lug wrench to confine the lug wrench radially, said containment ring spaced inwardly of the periphery of the defined circle a distance substantially equal to the distance of the location of the lug nuts inwardly from the peripheral wall of the wheel well.

4,630,512

ADJUSTABLE MOTOR-OPERATED SCREW DRIVING DEVICE

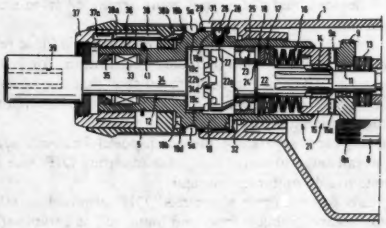
Paul Dürr, Ulisbach, Switzerland, assignor to Hilti Aktiengesellschaft

Filed Sep. 3, 1985, Ser. No. 771,975

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1984, 3432382

Int. Cl.[4] B25B *23/157*

U.S. Cl. 81—475 **3 Claims**



1. Motor driven screw driving device comprising a housing having a front end and a rear end, a drive unit located within said housing adjacent the rear end thereof, a drive member located within the front end of said housing and extending from the front end of said housing for operative engagement with a screw for driving the screw into a receiving material, an adjustable torque limiting coupling operatively connecting said drive unit and said drive member, an axially elongated stop sleeve located within and extending in the front end-rear end direction of said housing and having a front end and a rear end, said stop sleeve is adjustably displaceable relative to the housing in the front end-rear end direction thereof, said torque limiting coupling includes an adjustable spring element located within said stop sleeve for adjusting said torque limiting coupling, said stop sleeve includes a depth stop adjacent the front end thereof, said depth stop being displaceable in the front end-rear end direction of said housing relative to said stop sleeve, an actuating sleeve connected to said depth stop for

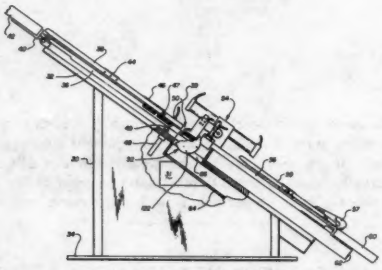
rotating said depth stop, said actuating sleeve being displaceable in the front end-rear end direction of said housing, wherein the improvement comprises that said actuating sleeve includes a connecting member for selective interengagement with said stop sleeve so that said actuating sleeve and said stop sleeve can be rotated as a unit.

4,630,513

AUTOMATIC DIP TRIMMER APPARATUS

Ernst Keller, 259 Leota Ave., Sunnyvale, Calif. 94086

Filed Feb. 14, 1985, Ser. No. 701,409
Int. Cl.[4] B23D *33/02*
U.S. Cl. 83—152 **18 Claims**



1. An improved lead frame trimmer apparatus for trimming Cerdip type DIP devices having a lead frame that extends fore and aft of the ends of the device terminating in horizontal tabs or the like, comprising:

means forming an inclined input rail for receiving untrimmed DIP devices;

means forming an inclined output rail for receiving trimmed DIP devices, said output rail being separated from said input rail;

lead trimming cutter means disposed between said input rail and said output rail and including insert means for positioning a DIP device to be trimmed such that one of said tabs engages a first stop and the other rests upon a support surface forming a part of said insert means;

singulating and separating means disposed between said input rail and said cutter means for admitting DIPs one at a time to said cutter means; and

lift means for engaging a trimmed DIP disposed in said cutter means, lifting it from said input rail, and transporting it to said output rail.

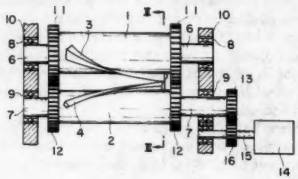
4,630,514

ROTARY DRUM SHEAR

Shunji Ohmori; Hiroyuki Takenaka; Akira Hozoji; Kazunori Kono; Kiyomitsu Yoshikawa, and Seishi Kajihara, all of Mitsubishi, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Mar. 4, 1985, Ser. No. 707,844
Int. Cl.[4] B23D *25/12*
U.S. Cl. 83—342 **3 Claims**

1. A rotary drum shear comprising, two drums rotating in opposite directions to each other and around spaced-apart parallel axes and each having a spiral knife on the periphery thereof so that material fed between the drum in a feed direction is cut by engagement of the knives, the axes being perpendicular to the feed direction, the knives having cutting edges which is at a radii r_A and r_B from the axis of their respective drums that are gradually reduced along the axis of the drums from a starting point of engagement between the knives,



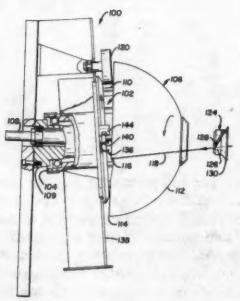
whereby a cut which is perpendicular to the feed direction can be made.

4,630,515

APPARATUS FOR CUTTING CONTINUOUS STRAND

Albert E. Spaller, Johnson City, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 15, 1985, Ser. No. 787,561
Int. Cl.[4] D01G *1/04*
U.S. Cl. 83—402 **8 Claims**



1. An apparatus for cutting a continuous strand into predetermined lengths comprising

a cutting head mounted for rotation around its axis and having an array of spaced cutting blades projecting radially around the cutting head,

a strand winding device mounted to rotate around an axis intersecting the axis of the cutting head and comprising a dome extending arcuately across the diameter of the cutting head and defining a circumferential edge spaced radially outwardly from and around the cutting head, said circumferential edge being in line with the array of cutting blades and having a strand hooking member adapted to catch a continuous strand moved into its path of rotation and guide the continuous strand to and around the array of cutting blades as the strand winding device rotates,

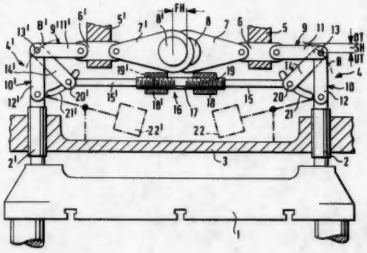
guide means spaced at a position from the center of the dome of the strand winding device and equidistant from said circumferential edge, said guide means comprising a toroidal strand guide member having a curved interior annular guide surface and defining a diagonal slot extending from and across the outer diameter of the toroidal strand guide member and through the curved interior annular guide surface; and

means for supporting said guide means at said position.

4,630,516
ECCENTRIC PRESS

Elmar Koch, Bad Homburg, and Hermann Gleich, Friedrichsdorf, both of Fed. Rep. of Germany, assignors to Mabu-Pressen Maschinenfabrik Karl Burkard KG, Oberursel, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 676,829
Int. Cl.[4] B26D *5/18, 7/26*
U.S. Cl. 83—530 **8 Claims**

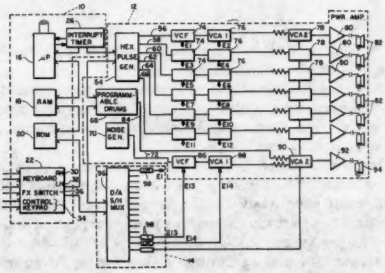


1. An eccentric press, comprising:
at least one eccentric portion which is disposed on a driven eccentric shaft, has invariable eccentricity and is engaged by a connecting rod;
at least one lever arrangement which connects the connecting rod to a press ram for converting movement of the connecting rod to a press ram stroke;
a counterweight for mass balancing the eccentric press during movement; and
a stroke adjustment means including a support lever which is articulately connected to an articulation point between the lever arrangement and an adjustment rod and which guides a joint at one end thereof on an adjustable movement path and whose other end thereof is guided variably in a circular arc,
wherein a center point of the circular arc coincides with the articulation point, which corresponds to a bottom dead center of the press ram.

4,630,517
SHARING SOUND-PRODUCING CHANNELS IN AN ACCOMPANIMENT-TYPE MUSICAL INSTRUMENT

Robert J. Hall, 20756 Tribune St., Chatsworth, Calif. 91311; George R. Hall, 13613 Huston St., Sherman Oaks, Calif. 91423, and Jack C. Cookerly, 26916 Barbacoa Pl., Saugus, Calif. 91350

Continuation-in-part of Ser. No. 274,606, Jun. 17, 1981, Pat. No. 4,508,002. This application Jun. 15, 1984, Ser. No. 621,327
Int. Cl.[4] G10H *1/22*; G10F *1/00*
U.S. Cl. 84—1.01 **14 Claims**

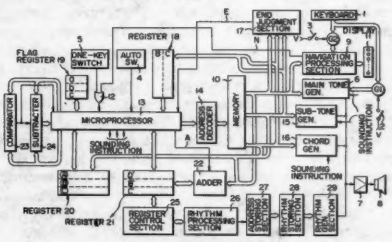


1. In a method for providing musical accompaniment in response to the playing of a musical instrument, wherein the accompaniment has a plurality of musical components performing different musical functions, the improvement comprising the steps, accomplished by the instrument itself, of:
providing access to a first preselected number of physical sound-producing channels;
defining a second preselected number of virtual channels which effectively function as physical sound-producing channels, each of the virtual channels corresponding to a musical component which might be sounded through one of the physical sound-producing channels;
generating accompaniment information for said second preselected number of virtual channels to implement said plurality of musical components, the second preselected number exceeding the first preselected number at least once during the playing of the instrument; and
mapping the virtual channels into the physical channels such that the allocation of physical channels between said plurality of musical components fluctuates over time.

4,630,518
ELECTRONIC MUSICAL INSTRUMENT

Ryuuzi Usami, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1984, Ser. No. 656,691
Claims priority, application Japan, Oct. 6, 1983, 58-185846
Int. Cl.[4] G10F *1/00*
U.S. Cl. 84—1.03 **5 Claims**

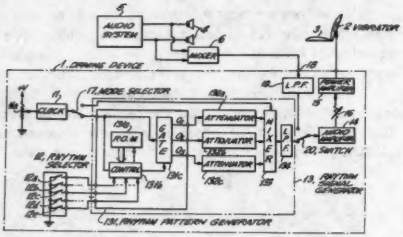


1. An electronic musial instrument having a keyboard and comprising:
memory means for storing a plurality of different autoplay data;
reading means coupled to said memory means for retrieving selected autoplay data sequentially at a predetermined timing frequency;
comparing means for comparing said predetermined timing frequency with a timing of play operation executed by a player on said keyboard for generating a time difference signal; and
correcting means coupled to said comparing means for modifying the predetermined timing frequency for retrieving said autoplay data when said time difference signal is beyond a predetermined range while retrieving said autoplay data at the predetermined timing frequency when the time difference signal is within the predetermined range.

4,630,519
DEVICE FOR RHYTHMICALLY DRIVING AN ELECTROMECHANICAL VIBRATOR

Mutsuo Hirano, 5-10-3, Motobuto, Urawa-shi, Saitama-ken, and Nagatoshi Tsunoda, 662-2, Katsura-cho, Totsuka-ku, Yokohama-shi, Kanagawa-ken, both of Japan

Filed Jun. 21, 1985, Ser. No. 747,368
Int. Cl.[4] G10H *1/42*
U.S. Cl. 84—1.03 6 Claims



1. A driving device for an electromechanical vibrator comprising:

means for generating a clock pulse signal of a constant repetition frequency of less than about 12 Hz;

rhythm selecting means for selecting one of a plurality of different musical rhythms;

rhythm signal generating means including rhythm pattern generator means coupled with said clock pulse generating means and said rhythm selecting means, said rhythm pattern generator means having at least two output terminals from which electric pulses are outputted corresponding to respective beats of a music rhythm as selected by said rhythm selecting means at a tempo controlled by the repetition frequency of said clock pulses, a first one of said at least two output terminals providing pulses corresponding to strong beats of the selected music rhythm while a second one of said at least two output terminals providing pulses corresponding to weak beats of said selected music rhythm, first and second attenuator means coupled with said first and second output terminals, respectively, said first attenuator means having an attenuation factor lower than said second attenuator means, and mixer means coupled with the outputs of said first and second attenuator means for mixing the output signals of said first and second attenuator means to provide said rhythm signal;

mode selector means for selecting one of a first mode to drive said electromechanical vibrator at a desired music rhythmical vibration, and a second mode to drive said electromechanical vibrator at a constant vibration frequency, said mode selector means being connected to an output of said clock pulse generating means so that the clock pulse is applied to said rhythm pattern generator means in said first mode but is applied to said mixer means in said second mode; and

amplifier means for amplifying said rhythm signal to produce a driving signal for said electromechanical vibrator.

4,630,520
GUITAR CONTROLLER FOR A MUSIC SYNTHESIZER

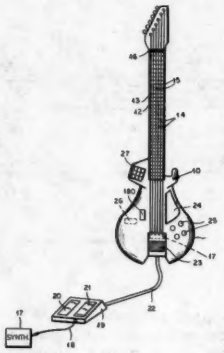
Carmine Bonanno, 820 Rushmore Ave., Mamaroneck, N.Y. 10543

Filed Nov. 8, 1984, Ser. No. 669,666
Int. Cl.[4] G10H *3/18*
U.S. Cl. 84—1.16 27 Claims

1. A method of detecting note selection in a guitar having a plurality of frets spaced apart along a neck of said guitar and a plurality of guitar strings extending along said neck over said frets, said method comprising the steps of:

(a) passing an electric current through each of said strings whereby a voltage gradient is established along each string at least in a region thereof overlying said frets;

(b) measuring a continuous voltage, from a high value representing last of said frets being selected and a low value representing none of sid frets being selected, forming part of said gradient of each string upon the depression thereof into contact with a respective fret without drawing significant electric current through the point of contact or deterring substantially said gradient, thereby determining a free tone-generating length of the respective string; and

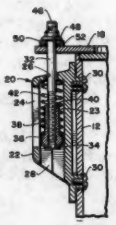


(c) controlling a music synthesizer to generate a corresponding tone in accordance with the measured voltage.

4,630,521
DRUM HEAD RETAINER

Darro F. Alletto, 13434 Chandler Blvd., Van Nuys, Calif. 91401

Continuation-in-part of Ser. No. 668,392, Nov. 5, 1984, abandoned. This application Jan. 16, 1986, Ser. No. 819,750
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—413 14 Claims



1. A drum head retainer for a drum employing a plurality of drum head retainers comprising:

(a) a casing having a vertical channel and an apertured side communicating with a portion of said vertical channel, said vertical channel terminating in an upper opening and a lower opening;

(b) means for attaching said casing to the side wall of a drum;

(c) a threaded bolt passing downwardly through said upper opening and threaded into a flanged nut provided with an integral, upwardly extending cylindrical portion and having a predetermined length, the upper end of which bolt is adapted for passing through means for providing tension on a drum head, said flange portion of said nut accommodated in said lower opening so as to provide lateral support of said nut;

(d) a spring maintained in said casing between said upper

opening and the top of said flange of said nut, centered in said vertical channel by said upwardly extending portion of said nut; and

(e) indicating means comprising a series of parallel markings for providing a measure of tension, said means indicating the relative position of a portion of said nut,

whereby turning of said bolt in a given direction applies tension to said drum head and simultaneously moves said nut relative to said indicating means so as to provide a measure of the extent of tension applied to said drum head.

4,630,522

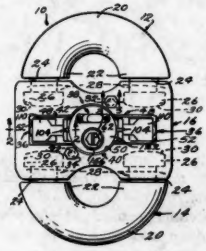
ACOUSTICALLY DETONATED EXPLOSIVELY RELEASABLE LINK

James E. Palmer, Berwyn; Rocco D. Albertini, Media, and Michael A. Coladonato, Havertown, all of Pa., assignors to Baldt Incorporated, Chester, Pa.

Filed Mar. 1, 1985, Ser. No. 707,492

Int. Cl.⁴ F41F 5/00

U.S. Cl. 89—1.14 **20 Claims**



1. A separable link for use in separably connecting two lengths of chain each having a multiplicity of interconnected links configured to be moved through a restricted chain handling mechanism, said separable link comprising: a plurality of removably interconnected parts operable when interconnected to interengage with the end links of the two lenghts of chain; fastener means for operably retaining said parts in interconnected relation in interengagement with the end links; explosive means within said fastener means operable to be detonated so as to separate said fastener means, the parts of said separable link and hence the two lengths of chain; miniaturized acoustical receiver means for receiving a transmitted acoustical detonation signal and causing said explosive means to detonate said fastener means; said explosive means and said miniaturized acoustical receiver means being mounted on said parts such that when said parts are retained in interconnected relation as aforesaid the separable link is shaped to be moved through the restricted chain handling mechanism with the links of the two lengths of chain, the improvement which comprises:

said fastener means comprising a pair of bolt assemblies mounted in spaced operative relation within said parts, each of said bolt assemblies including a bolt having a cavity therein;

said explosive means including an explosive in each cavity and electrically actuated means for detonating each explosive;

said miniaturized acoustical receiver means including hydrophone means for receiving a transmitted acoustical detonation signal, battery means and circuitry means operatively connected with said hydrophone means, said battery means, and said electrically actuated detonation means for conducting an electrical current from said battery means to said electrically actuated detonation means in response to said hydrophone means receiving a transmitted acoustical detonation signal, and

water pressure resistant container means mounted in said parts between said pair of spaced bolt assemblies for containing said battery means and said circuitry means including the operative connections thereof free from contact with water under pressure and for retaining said hydrophone means in a position of proximity to water under pressure such as to receive an acoustical detonation signal transmitted through said water under pressure.

4,630,523

ELECTROHYDRAULIC REGULATING DRIVE

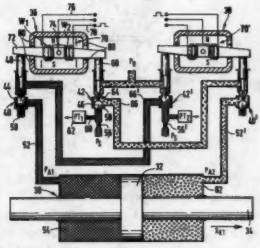
Johannes Tersteegen, Brunswick, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 564,348, Dec. 21, 1983, abandoned, which is a continuation of Ser. No. 259,242, Apr. 30, 1981, abandoned. This application Feb. 27, 1985, Ser. No. 706,892

Claims priority, application Fed. Rep. of Germany, May 3, 1980, 3017080

Int. Cl.⁴ F01B 25/26

U.S. Cl. 91—1 **2 Claims**



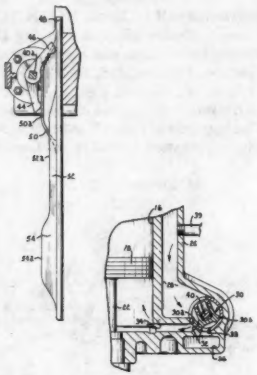
1. An electrohydraulic regulating drive, particularly for aircraft controls, comprising a regulating cylinder including a piston with equal load faces capable of being loaded at either side thereof and cylinder chambers connectable alternatingly to the pressure side and the return flow of a hydraulic system, the chambers of said regulating cylinder being adapted to be supplied with oil volumes in the form of discreet oil volumes necessary for positioning the piston by means of electrohydraulic switch valves actuated by a switch pulse sequence, a computer by which the switch pulses to be fed to the valves are determined, and sensors connected between said electrohydraulic switch valves and the pressure side of said system generating electrical signals and being connected to said computer for feeding back said signals thereto, said electrohydraulic switch valves being bistable controlled ball valves, the opening times of said electrohydraulic switch valves being determined by the computer with pulses of variable duration in dependence on the predetermined adjustment distance of the regulating piston, the electrical signals generated by the sensors being fed back to the computer purely as a confirmation of operation, said electrohydraulic regulating drive further comprising stop valves at the pressure side of said hydraulic system opening in direction to the regulating cylinder, and restrictors at the pressure side before the electrohydraulic switch valves for determining the throughput of fluid, the stop valves being each formed as releasable stop valves and being provided between the electrohydraulic switch valves and the corresponding cylinder chambers of the regulating cylinder, the stop valves and the electrohydraulic switch valves being switched in such way that in the resting position both cylinder chambers are closed by the stop valves and both electrohydraulic switch valves are opened towards the return flow, and wherein for positioning the regulating piston always one of the switch valves is switched to open in direction of the pressure side of said hydraulic system and at the same time the stop valve connected to the opposite cylinder chamber is released.

4,630,524

CONTROL VALVE FOR PILE DRIVER AND METHOD

E. Don Jackson, Jackson County, Mo., assignor to Conmaco, Inc., Kansas City, Kans.

Filed Aug. 13, 1984, Ser. No. 639,701
Int. Cl.[4] F01L *31/00*
U.S. Cl. 91—219 6 Claims



1. In a power driver having a drive head, a cylinder, and a piston, said piston being coupled with said drive head and said cylinder having an intake port and an exhaust port, said cylinder being adapted to be coupled with a source of compressible fluid, and further including a valve for controlling the flow of said fluid to and from said cylinder, the improvement comprising the combination of:

a first valve trip coupled with said valve;

a second valve trip coupled with said valve;

a slide bar movable along a rectilinear path in response to movement of said piston;

first camming means on said slide bar for moving said first valve trip to a first position wherein said intake port is open and said exhaust port is closed, whereby said fluid enters said cylinder under compression;

second camming means on said slide bar for moving said second valve trip to a first position wherein said valve blocks passage of said fluid to said cylinder will also preventing escape of said fluid from said cylinder, said second camming means maintaining said second valve trip in said first position for a sufficient length of time to allow the expansion of the fluid to move the piston along a significant portion of its travel distance; and

third camming means on said slide bar for moving said second valve trip to a second position wherein said intake port and said exhaust port are in communication whereby said fluid is exhausted from said cylinder.

4,630,525

VACUUM BOOSTER ASSEMBLY

Michiharu Nishii, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 26, 1985, Ser. No. 716,205
Claims priority, application Japan, Mar. 29, 1984, 59-045589[U]
Int. Cl.[4] F15B *9/10*
U.S. Cl. 91—369 A 4 Claims

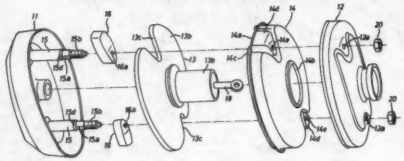
1. A vacuum booster assembly, comprising:

a front shell made of pressed sheet metal and having an annular opening end portion;

a rear shell made of pressed sheet metal and having an annular opening end portion coupled with the annular opening end portion of said front shell;

a power piston housed within said coupled shells, said power piston having a cylindrical portion axially slidably supported on said rear shell and a pressure receiving portion secured to the front end of the cylindrical portion, the pressure receiving portion being formed with a pair of radial recesses;

a diaphragm member attached to the pressure receiving portion of said power piston to subdivide the interior of said shells when coupled into a constant pressure chamber and a variable pressure chamber, said diaphragm member having an outer annular bead clamped between the annular opening end portions of said shells, an inner annular bead coupled over the cylindrical portion of said power piston, a flexible portion extending along the contour of the pressure receiving portion of said power piston, and a pair of radially extending, extruded support portions formed to correspond with the radial recesses of the pressure receiving portion of said power piston;



a pair of support members having a through hole therein and positioned within the support portions of said diaphragm member in such a manner as to permit axial movement of said power piston;

a pair of tie bars extending in parallel respectively across said front shell, through said through hole in said support member, across the support portion of said diaphragm member and said rear shell and fastened at opposite ends thereof to said front and rear shells to clamp the support portions of said diaphragm member between said support members and said rear shell, and

valve means assembled within the cylindrical portion of said power piston for selectively connecting said variable pressure chamber to said constant pressure chamber or atmospheric air in response to operation of said power piston.

4,630,526

FORCE CONTROL SYSTEM INCLUDING BYPASS FLOW PATH FOR IMPLEMENT WITH RELATIVELY MOVABLE FRAME PARTS

Ronnie F. Burk, Waterloo; Larry M. Delfs, Cedar Falls; Michael R. Gilmore, Davenport, all of Iowa, and Warren L. Thompson, Colona, Ill., assignors to Deere & Company, Moline, Ill.

Filed May 8, 1985, Ser. No. 731,699
Int. Cl.[4] F15B *13/06;* B60G *11/30;* A01B *73/00*
U.S. Cl. 91—452 11 Claims

1. A force control system for an implement, the implement having a first frame part, a second frame part movable with respect to the first frame part, and at least one of the frame parts supporting a ground-engaging tool, the control system comprising:

a hydraulic cylinder for connection between the frame parts to move one frame part with respect to the other;

a pump;

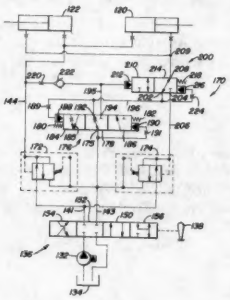
a reservoir;

a control valve for controlling fluid communication between the pump, the reservoir and head and rod ends of the cylinder, the control valve having first and second outlet ports;

a pressure-controlling valve connected between one outlet port of the control valve and one end of the cylinder; and

a bypass circuit communicated with the other outlet port

and comprising means for bypassing fluid flow around the pressure-controlling valve from one end of the cylinder to the control valve when the cylinder is moving in response to pressurization of its other end, and comprising means



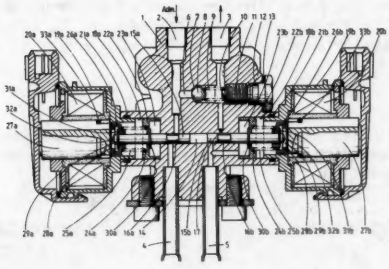
for communicating fluid pressure from the control valve to the one end of the cylinder via the pressure-controlling valve when the cylinder has reached a limit of its motion in response to pressurization of its other end.

4,630,527

ELECTRO-HYDRAULIC HEIGHT CORRECTOR FOR MOTOR VEHICLES

Philippe P. Quin, Vincennes, France, assignor to Automobiles Citroen, Neuilly and Automobiles Peugeot, Paris, both of, France

Filed Jul. 26, 1984, Ser. No. 634,762
Claims priority, application France, Jul. 27, 1983, 83 12746
Int. Cl.[4] F15B *11/08*
U.S. Cl. 91—449 **2 Claims**



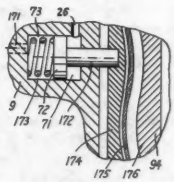
1. In an electro-hydraulic height corrector for a motor vehicle comprising an hydraulic distributor having ducts connected to a pressurized supply source, to suspension cylinders and to an exhaust circuit, and means for connecting these different ducts together, and detecting means sensitive to the position of a suspended part of the vehicle with respect to a nonsuspended part thereof operatively connected to said distributor, the improvement wherein said distributor comprises two slide valves each connected to a core of an electromagnet, one of said slide valves being inserted in a fluid path directly connecting an intake duct to an exhaust duct and the other of said slide valves being inserted directly in a fluid path connecting a user duct to an exhaust duct, said slide valves being subject to the action of first and second resilient means tending to return the first slide valve to a position in which communication between the intake and the user ducts is established and the second slide valve to a position in which communication between the user and exhaust ducts is interrupted and a ball valve which is subject to the action of third resilient means and is inserted in a path connecting said intake duct and said user duct together, said user duct being connected to said suspension cylinder of said electromagnets being operated by said detecting means, the core of each electromagnet being connected to the corresponding slide valve by a lost motion connection and said resilient first and second means acting on the respective cores, said first and second resilient means each bearing on a cup which is controlled by the core of the respective electromagnet and engages a first stop integral with the respective slide valve, a second stop integral with the respective slide valve being engageable with a fixed element of the distributor so as to limit the travel of the respective slide valve and maintain a certain clearance in the rest position between an end of each slide valve and the respective core of the electromagnet, said second stop being formed by a washer engaged in a groove of the respective slide valve and movable inside a chamber formed in the fixed part of said distributor.

4,630,528

FLUID MOTOR WITH ARRESTING AND DISARRESTING MEANS

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Division of Ser. No. 243,324, Mar. 13, 1981, Pat. No. 4,456,430.
This application Jun. 12, 1984, Ser. No. 619,958
Int. Cl.[4] F01B *13/06*; B60T *11/00*; F16D *11/06*
U.S. Cl. 91—491 **4 Claims**



1. A fluid motor, comprising, in combination, a housing with a therein revolvable rotor, fluid intaking and expelling working chambers, entrance port and exit port means, passage means between said ports and said chambers and fluid flow control means between said housing and said rotor;

wherein

said rotor includes a thrust chamber with a thrust piston therein with one end of said piston communicated to one of said passages and the other end of said piston subjected to a thrusting spring,

wherein

said piston extends with a piston shaft from said thrust chamber through a portion of said rotor and out of said rotor to engage a plate provided between said rotor and an inner portion of said housing,

wherein

said housing forms said inner portion adjacent of said plate while said inner portion of said housing forms a wave configuration with valleys and hills with said hills more close to said plate than said valleys;

wherein

said plate forms towards said inner portion a configuration complementary relative to said inner portion,

wherein

said spring is provided to thrust said piston against said plate and said plate against said inner portion of said housing to thereby arrest said valleys and hills in each other and said rotor on said housing, and;

wherein

pressure in the fluid in said passage presses said piston inwardly in said thrust chamber in said rotor to disengage said configurations and thereby to disarrest said plate from said inner portion and said rotor from said inner portion of

said housing to permit the revolution of said rotor in said housing.

4,630,529

PNEUMATICALLY OPERATING DEVICE COMPRISING MEANS FOR LIMITING THE DISPLACEMENT OF A PISTON

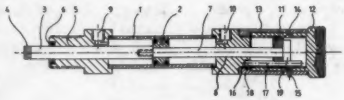
Hendricus C. P. Tijs, Mierlo, Netherlands, assignor to Weld-Equip b.v., Helmond, Netherlands

Filed Nov. 29, 1984, Ser. No. 676,284

Claims priority, application Netherlands, Dec. 5, 1983, 8304168

Int. Cl.⁴ F15B *15/24*

U.S. Cl. 92—13 **7 Claims**



1. A fluid operated piston having an adjustable stroke including a cylinder having first and second end walls, the piston having first and second end faces and being reciprocatingly situated in the cylinder, the first face of the piston and the first end wall of the cylinder defining a work space, a first reciprocating pin fixed to and extending axially from the first face of the piston and extending through the work space and the first end wall, a second reciprocating pin fixed to and extending axially from the second face of the piston and through the second end wall, a cylindrical sleeve member having internal threads, the sleeve extending axially from the second end wall of the cylinder, a first stop member comprising an annular setting ring having a side facing the cylinder and a side facing away from the cylinder and threads on its periphery and threadedly received within the cylindrical sleeve member, a means to prevent rotation of the setting ring, the second pin slidably extending through the setting ring and having a second stop member capable of abutting the first stop member on the side thereof facing away from the cylinder, the cylindrical sleeve being rotatably mounted such that rotation of the sleeve causes axial displacement of the setting ring thereby adjusting the stroke of said piston.

4,630,530

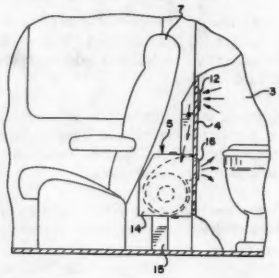
FILTERING SYSTEMS FOR BUSES

William R. Eckstrom, Dolton, Ill., and John R. Conrad, Westlake Village, Calif., assignors to Travel-Aire, Inc., Dolton, Ill.

Filed May 9, 1984, Ser. No. 608,382

Int. Cl.⁴ B60H *3/06*

U.S. Cl. 98—2.11 **20 Claims**



4. A filtering unit for a bus, the unit comprising outer housing of a size to fit between a row of seats in the bus and a forwardly facing vertical wall of a bus lavatory behind said row of seats, the housing having an upper portion with a downwardly and forwardly inclining front wall portion for clearing the rearwardly sloping back portion of the adjacent row of seats, and air inlet and air outlet openings for communication with openings in vertically spaced portions of said vertical lavartory wall, said housing including air circulating fan means for drawing air from said air inlet opening and discharging filtered air through said air outlet opening, and an air filtering means in the path of movement of said air in said housing between said air inlet and air outlet openings and including means for removing at least lavatory odor-causing gaseous and particle materials from the air stream passing therethrough.

4,630,531

BULK SILO

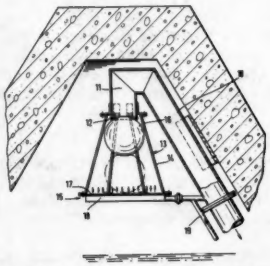
Werner Krauss, Hamburg, Fed. Rep. of Germany, assignor to Claudius Peters AG, Fed. Rep. of Germany

Filed Jul. 30, 1985, Ser. No. 760,467

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1984, 3429715

Int. Cl.⁴ E04H *7/22*

U.S. Cl. 98—52 **4 Claims**



1. In a bulk silo with an outlet chamber having an upper area from which an open non-vertical ventilation line runs, and a closing part for protection against flooding, the improvement comprising a closing part constructed as a float cage (13) surrounding a float valve comprising a float having a given area (16, 20), and a float valve opening edge (12); said cage having an aeration device (17) under the float area within said cage.

4,630,532

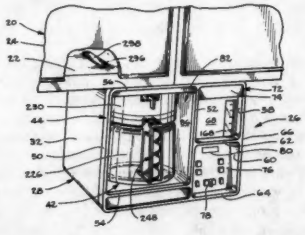
COFFEEMAKER

Kurt J. Sonnentag, Naperville, and Norman A. Steinkamp, La Grange Park, both of Ill., assignors to John Zink Company, Tulsa, Okla.

Filed Apr. 12, 1985, Ser. No. 722,941

Int. Cl.⁴ A47J *31/10*; A47B *57/02*

U.S. Cl. 99—279 **38 Claims**



1. A coffeemaker comprising a housing having a carafe-receiving cavity in the front thereof, a water reservoir, a carafe having a coffee basket supported therein, a cover for said carafe having a spreader configuration in its upper surface, said carafe and cover being insertable in said cavity, means for heating said reservoir water and directing said heated water from the upper portion of said carafe-receiving cavity to said spreader configuration of said carafe cover, and sealing means

mounted in said cavity for automatically sealing the upper portion of said cavity to the upper surface of said carafe cover when said carafe is inserted into said cavity.

4,630,533

COOKING EXTRUDER

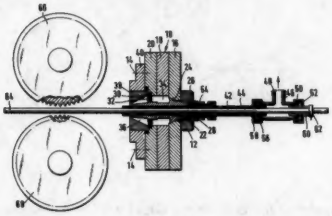
Heinz Schaaf, Camberg-Oberselters, and Horst Walter, Grevenbroich, both of Fed. Rep. of Germany, assignors to Convent Knabber-Geback GmbH & Co., Cologne, Fed. Rep. of Germany

Filed Sep. 5, 1985, Ser. No. 772,636

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1984, 3433013

Int. Cl.[4] A47J *37/00*; A21C *9/06*

U.S. Cl. 99—353 **19 Claims**



1. A cooking extruder head for use with a cooking extruder, having a source of envelope material and a source of filling material, said cooking extruder head comprising:

a nozzle plate having opposed forward and rearward sides, said nozzle plate being characterized by forward and rearward apertures offset from one another and extending into the respective forward and rearward sides of said nozzle plate, and a passage extending between said forward and rearward apertures and providing communication therebetween, said nozzle plate being connectable to said source of envelope material at the rearward aperture therein, such that the envelope material is deliverable to the forward aperture of said nozzle plate through said passage; and

a filling tube connectable to said source of filling material and adjustably and removably mounted to said nozzle plate and extending entirely therethrough from the rearward side to the forward side thereof, said filling tube being substantially aligned with and extending from the forward aperture therein and being angularly aligned to said passage, whereby the amount of extension of the filling tube from the forward side of said nozzle plate is selectively adjustable and whereby the filling tube is selectively removable from said nozzle plate.

4,630,534

APPARATUS FOR INACTIVATION OF ENZYMES IN OIL SEEDS

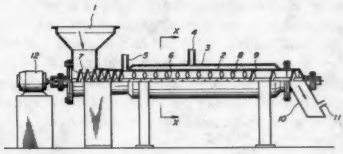
Kanji Tsuchiya, Tokyo, and Shizumi Ono, Chiba, both of Japan, assignors to Seikensha Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,850

Int. Cl.[4] A23C *3/02*

U.S. Cl. 99—483 **6 Claims**

2. An apparatus for inactivation of enzymes in oil seeds comprising an elongated pressure cylinder having an upstream end and a downstream end, feed hopper means for feeding oil seeds to the interior of said pressure cylinder at the upstream end thereof, said hopper means being mounted on said pressure cylinder; exhaust pipe means for discharging treated oil seeds from the downstream end of the pressure cylinder, said exhaust pipe means being mounted at the down-stream end of said pressure cylinder; a pressure cylinder jacket surrounding said pressure cylinder along at least a part of the length thereof, said jacket being provided with a water vapor supply pipe; said pressure cylinder being perforated with holes over its surface lying within said pressure cylinder jacket, said holes having diameters less than 1.5 mm; a buffering solution supply pipe means for supplying buffering solution to the interior of said pressure cylinder at a location corresponding to about ¼ of the length of said pressure cylinder from the upstream end thereof and without passage through said jacket; a rotary axle



located within said pressure cylinder and coaxial therewith, and provided with a first conveying screw, an agitation fan screw and a second conveying screw, said first and second conveying screws being in slidable contact with the internal wall face of said pressure cylinder so that the space formed by said internal wall face of said pressure cylinder and the screw blades of said first and second conveying screws is maintained air tight.

4,630,535

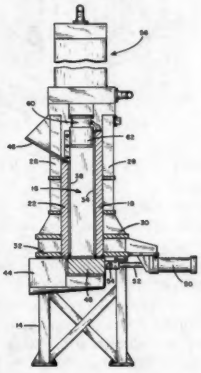
METHOD AND APPARATUS FOR DE-WATERING BIOMASS MATERIALS IN A COMPRESSION DRYING PROCESS

John G. Haygreen, Roseville, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Oct. 12, 1984, Ser. No. 660,066

Int. Cl.[4] B30B *9/06*

U.S. Cl. 100—127 **8 Claims**



1. Apparatus for reducing the moisture content of biomass material comprising:

an enclosed chamber having generally vertical side walls and a base forming the bottom of said chamber and movable with respect to said side walls;

means for loading moisture ladened biomass material into said chamber;

a vertically reciprocable ram having a working face opposed to said movable base, and disposed in said chamber in slidable relationship to said vertical side walls;

a conduit means elongate in the generally vertical direction along said side walls for conducting moisture removed from said biomass material out of said chamber;

means for applying a predetermined force on said ram for pressing said biomass material against said base; and

means forming a select, non-planar profile in said working face, for developing and sustaining a selected pressure gradient across said biomass material as said ram presses thereagainst; said profile converging toward said base and characterized by a plurality of discrete, substantially horizontal stepped portions, and a vertical stepped portion joined with each pair of adjacent horizontal portions; said gradient characterized by a maximum pressure at the center of said chamber diminishing to a minimum pressure near said side walls to drive moisture radially outward from said center, yet provide a minimum pressure sufficiently large to expel moisture out of said chamber through said conduit means; thus to enhance the amount of moisture expelled from said biomass material and chamber as said ram presses against said material.

4,630,536

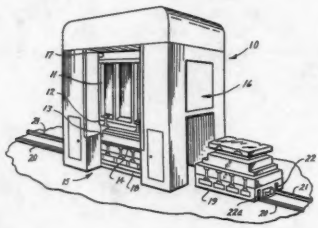
HYDRAULIC DRIVE APPARATUS FOR DIE CARRIERS

Chandrakant K. Shah, Niles, Ill., assignor to Avondale Industries, Inc., New York, N.Y.

Filed Nov. 18, 1985, Ser. No. 798,913

Int. Cl.[4] B30B *15/06*

U.S. Cl. 100—229 R **11 Claims**



1. A hydraulically driven die carrier for a power press, said carrier comprising:

a bolster for carrying a die;

a set of wheels supporting said bolster for horizontal rolling movement to position said die horizontally;

a separate hydraulic drive motor for each of said wheels;

a plurality of hydraulic lift cylinders for moving said bolster vertically relative to said wheels; and

a hydraulic control system for operating said hydraulic drive motors and lift cylinders for horizontal rolling and vertical movement of said die carrier, said control system including:

a supply pump having two separate outputs for providing separate sources of pressurized hydraulic fluid for said hydraulic drive motors and for said lift cylinders;

a reservoir of hydraulic fluid connected to said pump;

valve means for connecting and disconnecting said separate sources of hydraulic fluid and the respective drive motors and lift cylinders; and

means for locking said lift cylinders in their raised positions while said cylinders are disconnected from said supply pump so that the hydraulic fluid in the line used to lift the carrier can be returned directly to the reservoir without being overheated as long as the carrier remains in its raised position.

4,630,537

SELECTIVE EMBOSSER WITH BUCKLING PREVENTION

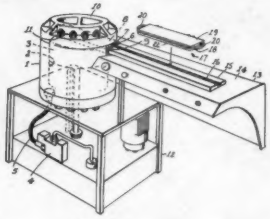
David J. Pretorius, Pretoria, South Africa, assignor to The National Savings & Finance Corp. (Proprietary) Limited, Johannesburg, South Africa

Continuation of Ser. No. 502,541, Jun. 14, 1983, abandoned, which is a continuation of Ser. No. 279,064, Jun. 30, 1981, abandoned. This application Aug. 22, 1985, Ser. No. 768,174

Claims priority, application South Africa, Jul. 2, 1980, 80/3982

Int. Cl.[4] B31F *1/07*; B44B *5/00*

U.S. Cl. 101—3 R **11 Claims**



1. Apparatus for embossing characters in a workpiece such as a motor vehicle registration plate, said apparatus comprising:

(a) buckling prevention means for preventing buckling of said workpiece during embossing, said buckling prevention means comprising:

a pair of cooperating press members reciprocally movable relative to each other and each having an operative face, at least one of said press members being movable and having an elongated configuration defining a piston which is snugly slidably received in a cylinder, said piston having an upper surface defining one of said operative faces, said piston and its operative face remaining substantially within said cylinder during movement of said piston in said cylinder, thereby preventing the operative face of the movable press member from moving out of alignment with the operative face of the other press member during movement of the movable press member relative to the other press member during the embossing operation;

at least on die for embossing one or more characters in said workpiece, said at least one die comprising first and second pivotally interconnected die members, said workpiece, during the embossing operation, being trapped between said first and second pivotally interconnected die members to provide a die/workpiece assembly, said die/workpiece assembly being locatable for the embossing operation between said pair of cooperating press members, said operative faces of said press members being of such dimensions that they extend over the whole of the die/workpiece assembly during the embossing operation;

(b) at least one die element carried by said first die member; said press members during the embossing operation exerting pressure equally over the entire/workpiece assembly to prevent buckling of said workpiece and to ensure evenly shaped embossed characters.

4,630,538

PORTABLE LABEL MAKER

Larry A. Cushman, 5151 Windham, Sterling Heights, Mich. 48078

Filed Apr. 22, 1985, Ser. No. 725,555

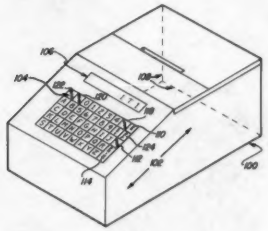
Int. Cl.[4] B30B *15/30*

U.S. Cl. 101—45 **13 Claims**

1. Apparatus operable to make a plurality of copies of a

designated sequence of symbology-bearing labels of adhesive tape, the tape being supplied in bulk, the bulk supply having a primary direction of orientation, the labels being defined by separation from the bulk by separating the tape along cut lines all having the same directional orientation to the primary direction of orientation of the bulk supply, the symbology borne by each of the labels being a copy of a member of the designated sequence and being contained within confines on the tape which are substantially parallel to the cut lines of the tape which define the labels, comprising:

means for causing the symbology to be placed on the tape within the confines;



means adapted to hold the bulk supply with its primary direction of orientation in fixed relationship to the symbology placing means;

input means for designating the number of copies and the sequence of symbologies desired to be borne by the labels;

means adapted to cause the symbology placing means to place the desired number of copies of the desired sequence of symbologies on the tape, the copies of the desired sequence being placed on the tape successively; and

advancing means for urging the tape, after the symbology has been placed thereon, past the symbology placing means.

4,630,539

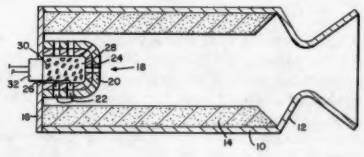
DEVICE FOR FLASH SUPPRESSION OF A ROCKET MOTOR

Lawrence B. Thorn, Madison, and Robert E. Betts, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 24, 1985, Ser. No. 747,742

Int. Cl.⁴ F42C *19/08*

U.S. Cl. 102—202 **5 Claims**



1. A rocket motor having a rocket motor housing with a forward end and an aft end that has a nozzle mounted thereat, a solid propellant grain of the fast burning and smokeless type mounted in said rocket motor housing between said forward and aft ends, a sustained action igniter means mounted within said rocket motor housing at the forward end for igniting said solid propellant grain to cause the solid propellant grain to produce combustion gases, said igniter means including support structure that surrounds and mounts pyrotechnic material and solid suppressant ablative material in direct contact with one another and contained therein, said solid suppressant ablative material acting when ablated to suppress burning of fuel rich gases from said solid propellant grain, and said structure having means therein for allowing gases produced therein to be communicated into the main rocket motor chamber, and initiater means provided for igniting the pyrotechnic material.

4,630,540

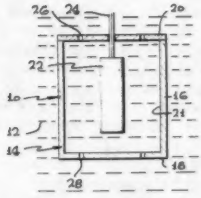
DETONATOR APPARATUS FOR LIQUID EXPLOSIVE COMPOSITIONS

Joseph L. Trocino, 15233 Ventura Blvd., P-8, Sherman Oaks, Calif. 91403

Filed Sep. 30, 1985, Ser. No. 781,348

Int. Cl.⁴ F42B *1/02*

U.S. Cl. 102—307 **12 Claims**



1. In a detonator apparatus for liquid explosive compositions, the combination which comprises:

a container enclosing a bulk quantity of combined explosive liquid ingredients;

a detonation amplifier submerged in said liquid ingredients within the confines of said container;

a portion of said explosive liquid ingredients held in said detonation amplifier;

a pyrotechnic charge immersed in said held portion of liquid ingredients; and

activation means operably coupled to said pyrotechnic charge for detonating said pyrotechnic charge causing detonation of said bulk quantity of combined liquid ingredients.

4,630,541

MOBILE TRACK LEVELING, LINING AND TAMPING MACHINE

Josef Theurer, Vienna, and Johann Hansmann, Klosterneuburg, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

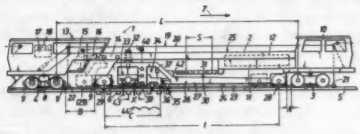
Filed Jun. 7, 1984, Ser. No. 618,122

Claims priority, application Austria, Aug. 19, 1983, 2981/83

The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.

Int. Cl.⁴ E01B *27/17*

U.S. Cl. 104—7.2 **20 Claims**



1. A mobile machine for leveling, lining and tamping a track consisting of two rails fastened to successive ties resting on ballast, which comprises

(a) a main frame supported on undercarriages for continuous movement in an operating direction,

(b) a power plant and operating control means carried by the main frame,

(c) an elongated subframe pivotally and longitudinally adjustably connected to the main frame, the subframe having two ends and being arranged ahead of one of the under-

carriages supporting the main frame, in the operating direction, and

(1) respective undercarriages supporting the subframe ends,

(d) tamping means mounted on the subframe between the respective undercarriages for tamping ballast in intermittent tamping cycles under respective ones of the ties at points of intersection of the two rails and the respective ties,

(e) track lifting and lining means associated with the two rails mounted on the subframe ahead of the tamping means at a fixed distance therefrom in the operating direction and being arranged on the subframe between the respective undercarriages,

(1) the subframe having a wheelbase which is at least double the distance of the track lifting and lining means from a respective one of the undercarriages supporting a rear one of the subframe ends, in the operating direction, the wheelbase having a length corresponding at least to about 14 to 16 times the average tie spacing,

(f) track leveling and lining reference systems associated with the track lifting and lining means, and

(g) a longitudinally adjustable coupling device pivotally connecting the elongated subframe to the main frame whereby the subframe moves with the main frame while being longitudinally adjusted in relation thereto.

4,630,542

NACELLE

Xavier M. Peyre, Ruvere, and Jean-Pierre Manesse, Basse Goulaine, both of France, assignors to Alsthom-Atlantique and Plastibenne, France

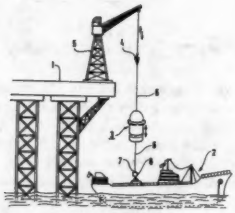
PCT No. PCT/FR83/00176, § 371 Date Apr. 25, 1984, § 102(e) Date Apr. 25, 1984

PCT Filed Sep. 7, 1983, Ser. No. 605,029

Claims priority, application France, Sep. 7, 1982, 82 15164

Int. Cl.[4] B63B *27/30*

U.S. Cl. 104—114 **5 Claims**



1. An autonomous nacelle for moving up and down a cable between first and second vertically spaced structures, one of said structures being a vertically heaving structure, one of said structures having an anchor point, and the other of said structures having a hook unit, said nacelle receiving said cable (6) with said cable passing through said nacelle and having a top end that leaves the nacelle upwardly and a bottom end that leaves the nacelle downwardly, said nacelle comprising:

means (11) within said nacelle for gripping said cable as it passes through said nacelle for driving the nacelle to move it up and down the cable when the top end of the cable is hooked to said hook unit (4), tensioning means (9, 10) within said nacelle and engaging said cable passing through said nacelle for enabling the top portion of the cable to be subjected to a tension greater than the weight of the nacelle while the bottom portion (7) of the cable is fixed to said anchor point, said tensioning means serving to vary the distance between the nacelle (3) and said hook unit at the top end of the cable, and means (12, 14) within said nacelle for acting, on command, on said tensioning means so as to prevent the distance between the nacelle (3) and the hook unit (4) at the top end of the cable from shortening while permitting it to lengthen.

4,630,543

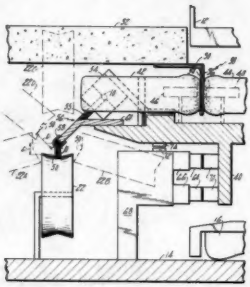
BOGIE FOR CABLE-DRAWN VEHICLE

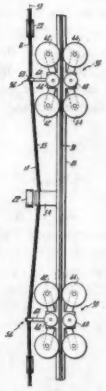
Norman McQueen, Parker, Colo., assignor to Otis Elevator Company, Farmington, Conn.

Filed Dec. 16, 1983, Ser. No. 562,137

Int. Cl.[4] B61C *11/02*

U.S. Cl. 104—173.1 **2 Claims**





1. A transportation system comprising:

a guideway having a flat smooth base, a guideway-side, and a longitudinal length, wherein a cross-sectional area of the guideway is defined by a plane normal to the longitudinal length of the guideway;

a vehicle supported by hoverpads above the base of the guideway;

a motor-driven cable disposed in the guideway for imparting motion to the vehicle;

sheaves, disposed at selected locations and orientations in the guideway, for providing both lateral and vertical support to the cable;

two spaced-apart cable support arms, each connected at one end to the vehicle and at the other end to the cable, for displacing the cable from the sheaves and replacing the cable onto the sheaves as the vehicle moves in the guideway;

a cable clamp, disposed on the vehicle between the two cable supports, for attaching the vehicle in driving relationship to the cable;

a vertically-oriented guiderail, disposed along the length of

the guideway and having a guideway-side face and an opposite face, for providing guidance to the vehicle as the vehicle moves in the guideway;

a rail follower, disposed on the vehicle, including two horizontally-oriented, horizontally spaced-apart wheels, one wheel disposed on each face of the guiderail, characterized in that:

a first portion of the cross-sectional area of the guideway is defined by the displacement of the cable by the cable support arms and the cable clamp;

the cable support arms are disposed substantially within the first portion of the cross-sectional of the guideway;

a second portion of the cross-sectional area of the guideway is defined by the wheel disposed on the guideway-side face of the guiderail;

the cable clamp is disposed within the second portion of the cross-sectional area of the guideway.

4,630,544

ACTUATING MECHANISM IN OVERHEAD RAIL EQUIPMENT

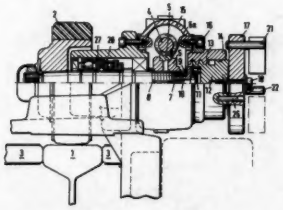
Joachim Hecht, Mettmann, and Gerhard Rudat, Hagen, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 551,567

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241626

Int. Cl.⁴ B61B *13/04*

U.S. Cl. 105—130 **10 Claims**



1. Overhead equipment including a rail means for suspending a vehicle, there being a drive wheel on the vehicle running on the rail, the vehicle having a motor driven shaft, the drive wheel having a shaft, there being a coupling interposed between the motor driven shaft and the shaft for the drive wheel, an actuating system comprising:

the coupling being constructed for obtaining connection and disconnection through rotational motion of one of its parts, there being a pair of pins extending axially from said part in a particular angularly spaced relation to each other;

at least one first actuating piece arranged along the rail at a relative disposition in relation to a passing vehicle so as to engage one of the pins for turning the rotational part of the coupling in one direction to cause the coupling to connect the two shafts; and

at least one second actuating piece also arranged along said rail at a relative disposition to a passing vehicle so as to engage the other one of the pins to thereby effect an oppositely effective turning motion of the rotatable part of the coupling to obtain disconnection between the two shafts.

4,630,545

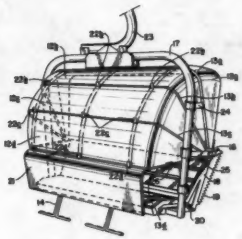
CHAIR LIFT FITTED WITH A PASSENGER PROTECTIVE DEVICE

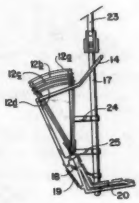
Max Michel, 7, rue de la Chapelle-St. Sauveur Aincourt, F 95510 Vetheuil, France

Filed Oct. 2, 1985, Ser. No. 783,099

Int. Cl.⁴ B60N *3/00*; B61D *17/12*; E04F *10/10*; A47C *1/00*

U.S. Cl. 105—329.1 **6 Claims**





1. A chair for an aerial cableway chair-lift comprising:

a seat with an open front side and a back,

a hanger for suspending the chair to the aerial cable,

a safe-guard rail pivoted to said seat and pivotal between an upward rest position and a forward position in which said safe-guard rail is positioned in front of the open front side of the seat,

a plurality of rigid plates partially encompassing said seat and each including a transverse portion connected to pair of lateral side portions, each of which is pivotally connected at its end to said seat for pivoting the plate about a transverse axis between an upward folded position, in which the transverse portions of the plates are disposed substantially horizontally, and an operative deployed position, said plates being shaped and so arranged that each one can slide above or under the next preceding one to become superposed in said upward folded position, the transverse portions being in their upward substantially horizontal position away from the front of the seat and towards the aerial cable and movable to their deployed position in which the plates are disposed side by side with their edges overlapping to form a continuous shield extending from above the seat to downward and frontward of the seat,

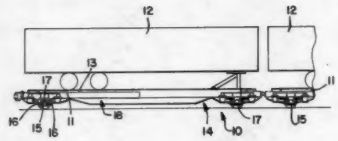
spring means resiliently biasing said safe-guard rail with respect to said seat to bias said rail and said plurality of plates towards said folded position.

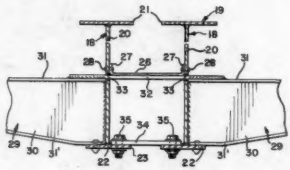
4,630,546

DOUBLE GROOVE CENTER SILL

Henry K. Wiger, Arlington, Va., and Manfred Katz, Statesville, N.C., assignors to Pullman Standard Inc., Chicago, Ill.

Filed Nov. 18, 1983, Ser. No. 553,316
Int. Cl.[4] B61D *17/00*
U.S. Cl. 105—416 **10 Claims**





1. A railway car comprising:
a pair of single axle railway car trucks; and
an underframe adapted to be supported on said car trucks;
said underframe including a longitudinally extending center sill;
said center sill having longitudinally opposite end portions being operatively associated with said car trucks and an intermediate portion connecting said end portions;
said intermediate portion having flexible means providing for torsional flexure to permit relative angular twisting of said end portions along a longitudinal axis to accommodate track profiles which tend to raise opposite corners of the underframe;
said centersill comprising upright laterally spaced side walls, and upper and lower horizontal walls,
said upper and lower horizontal walls being connected to said side walls and being substantially coextensive therewith;
said centersill having an aperture means providing for said torsional flexing of said walls; and
said aperture means defining slots in said upper and lower horizontal sill walls.

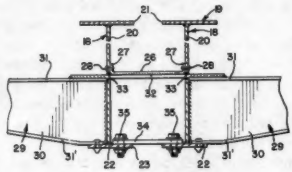
4,630,547

CROSS BEARER ARRANGEMENT FOR SLOTTED CENTER SILL

Phillip G. Przybylinski, Schererville, and John H. Spence, Munster, both of Ind., assignors to Pullman Standard Inc., Chicago, Ill.

Filed Apr. 5, 1984, Ser. No. 597,028
Int. Cl.[4] B61D *17/00*
U.S. Cl. 105—416 **14 Claims**

1. A railway car underframe comprising a center sill including horizontally spaced upright side walls and upper and lower horizontal walls connected to said side walls,
each of said horizontal walls including a pair of laterally spaced longitudinally extending middle portions being connected to the side walls, said middle portions defining therebetween a longitudinally extending slot to provide a torsionally flexible sill structure, said slots being substantially aligned with each other,
first and second crossbearer assemblies projecting outwardly from opposite sides of said center sill,
the first and second crossbearer assemblies each including an upright wall having upper and lower flanges, said lower flanges being connected to the lower horizontal wall of said sill, a connector member extending through said side



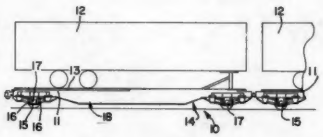
walls of said center sill connecting said first and second assemblies, and
tie means pivotally associated with each of the lower wall middle portions for providing lateral support for the lower wall middle portions in varying positions due to torsional flexure of the center sill.

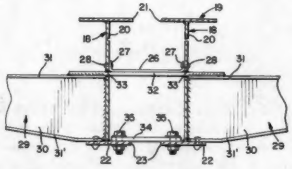
4,630,548

CENTER SILL HORIZONTAL DIVIDER

Henry K. Wiger, Arlington, Va., and Phillip G. Przybylinski, Schererville, Ind., assignors to Pullman Standard Inc., Chicago, Ill.

Filed Nov. 18, 1983, Ser. No. 553,252
Int. Cl.[4] B61D *17/00*
U.S. Cl. 105—416 **14 Claims**





11. A railroad car comprising:
a pair of single axle railway trucks; and
an underframe adapted to be supported on said car trucks, said underframe including a longitudinally extending center sill;
said center sill having longitudinally opposite end portions being operatively associated with said car trucks and an intermediate portion connecting said end portions;
said intermediate portion having torsionally flexible means providing torsional flexure of the center sill to permit relative angular twisting of said end portions along a longitudinal axis to accommodate track profiles which tend to raise opposite corners of the underframe; and
said flexible means including a pair of laterally spaced upright wall means connected to the end portions and being allowed movement to provide for torsional flexibility of the flexible means; and
reinforcing means for resisting lateral buckling of the wall

means, said reinforcement means being connected to both of the wall means to support laterally direction forces therein; and

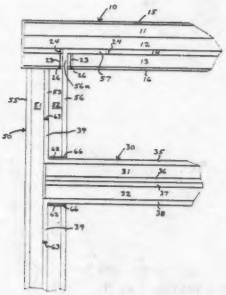
said reinforcing means being connected to said wall means at approximately midheight of the wall means thereby receiving the minimum stress due to relative movement of the wall means during torsional flexure.

4,630,549

STRUCTURAL LOCKING DEVICE

Phil B. Sheffer, New Oxford, Pa., assignor to Merchandising Innovations, Inc., Hanover, Pa.

Filed Dec. 26, 1985, Ser. No. 813,660
Int. Cl.[4] A47B *3/00*
U.S. Cl. 108—111 **9 Claims**



1. A factory preformed upper shelving unit means (**10**) comprising:

plural layer means (**11, 12, 13**) comprised of a corrugated fiberboard material,

an outer wrapping layer means (**15, 16**) formed around said plural layer means (**11, 12, 13**),

a flap recieving layer means (**14**) being formed between two of said plural layer means (**11, 12, 13**),

said flap receiving layer means (**14**) having a widened channel means (**24**) factory preformed therein,

at least one of said plural layer means (**13**) having narrow channel means (**23**) factory preformed therein and positioned so as to open into said widened channel means (**24**),

a portion of said outer wrapping layer means (**16**) having narrow channel means (**26**) formed therein and positioned so as to open into the narrow channel means (**23**) of said at least one plural layer means (**13**),

means whereby a flap (**57**) may be slid into said widened channel means (**24**),

and means whereby an extension (**56*a***) of said flap (**57**) is received by each of said narrow channel means (**23, 26**).

4,630,550

PREFABRICATED KNOCK-DOWN METAL-FRAME WORK TABLE

Harry L. Weitzman, White Plains, N.Y., assignor to Jack J. Weitzman, Spring Valley, N.Y.

Filed Apr. 2, 1985, Ser. No. 719,214
Int. Cl.[4] A47B *47/02*; F16B *7/00*
U.S. Cl. 108—155 **5 Claims**

1. A heavy duty, knock-down, prefabricated, metal-frame work table capable of supporting heavy loads, as for example, stacks of textile fabric laid up in preparation for a cutting operation, which frame can be shipped in disassembled form and easily assembled at a work site, said frame comprising:

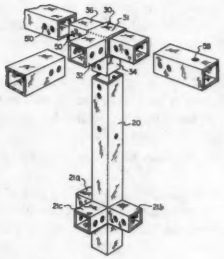
(a) a plurality of upper and lower end, side, and cross rails, each formed of a square steel tubing member open at the ends and of prescribed length;

(b) a plurality of vertical corner leg members formed of square steel tubing, each of said corner leg members further including a square steel tubing projection secured to and extending horizontally from the surface of each of two adjacent walls at a point intermediate the top and bottom thereof, and an open top, one of said projections being inserted into the open end of one of said lower side rails and the other of said projections being inserted into the open end of one of said lower end rails;

(c) a plurality of vertical side leg members formed of square steel tubing, each of said side leg members further including square steel tubing projections secured to and extending horizontally from the surface of three adjacent walls thereof at a point intermediate the top and bottom thereof and an open top, the central one of said projections being inserted into the open end of one of said lower cross rails and the other two projections being inserted into the open ends of two of said lower side rails:

(d) a plurality of connector members having a body portion formed of square steel tubing, each of said side connector members including square steel tubing projections secured to and extending perpendicularly from the surface of two adjacent walls of the body portion thereof of such length and cross sectional dimension as to be insertable into the open end of one of said leg and rail members;

(e) some of said connector members being arranged with the axis of the opening through the tubular body member aligned with the longitudinal axis of the upper side rails of said table, with one of said projections extending down-



wardly into the open top of a side leg member, and with the other of said projections extending horizontally inwardly into the open end of one of said upper cross rails, a relatively short bridging member formed of square steel tubing of such length and cross-sectional dimension as to be inserted axially through the opening in said tubular body portion and extend longitudinally from each end thereof for insertion into the ends of two adjacent upper side rail members;

(f) other of said connector members being arranged with the axis of the opening through the tubular body member aligned with the longitudinal axis of one of said corner leg members, with one of said projections extending horizontally into the open end of one of said upper end rails, with the other of said projections extending horizontally into the open end of one of said upper side rails, and a relatively short bridging member formed of square steel tubing secured to and extending axially in a downwardly direction from the opening in said tubular body portion, said short bridging member being of such length and cross-sectional dimension as to be inserted into the upper end of one of said corner leg members;

(g) each of said side rails, cross rails, leg members, projections and short bridging members being provided with a pair of openings in the opposite side walls thereof adjacent the free ends of said rails and the upper end of said leg members for receiving connecting bolts therethrough;

(h) a planar top member secured across the top of said frame;

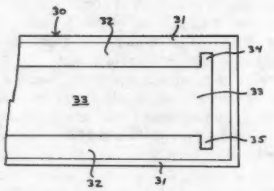
(i) whereby said upper and lower side and cross rails are

assembled to the projections and short bridging members extending from said side and corner members and bolted together to form said sturdy work table.

4,630,551
EXECUTIVE DESK

Phil B. Sheffer, New Oxford, Pa., assignor to Merchandising Innovations, Inc., Hanover, Pa.

Filed Dec. 26, 1985, Ser. No. 813,568
Int. Cl.[4] A47B 3/06
U.S. Cl. 108—159 **1 Claim**



1. An executive desk assembly kit comprising three distinct component parts as follows:

a vertical side wall assembly (10) comprising multiple factory pre-glued layers of corrugated fiberboard (12,13,14,15,16), wherein said vertical side wall layers include factory pre-formed narrow channel means for receipt of pedestal stabilizer means (20) and wider channel means for receipt of flaps (21) formed on said pedestal stabilizer means (20),

a pedestal stabilizer means (20) having flaps (21) formed on the ends thereof, said pedestal stabilizer means being sized so as to slidably interfit with the channel means of the vertical side wall assembly whereby a joinder is accomplished without the need for separate mechanical fasteners,

a desk top assembly (30) comprising plural factory pre-glued layers of corrugated fiberboard, wherein at least one lower layer of said desk top assembly has cut-away section means (33) for interfitting with the vertical side wall assembly (10) and the pedestal stabilizer means (20),

wherein said vertical side wall assembly (10) comprises:

a first outer wrapping layer (11) made of corrugated fiberboard,

a second layer (12) comprised of double wall corrugated fiberboard,

a third layer (13) comprised of double wall corrugated fiberboard,

a fourth layer (14) comprised of double wall corrugated fiberboard,

a fifth layer (15) comprised of double wall corrugated fiberboard,

a sixth layer (16) comprised of single wall corugated fiberboard,

and means wherein each of said layers (11–16) are factory pre-glued together for finished use in the executive desk assembly kit,

wherein said first outer wrapping layer (11) and all of said double wall corrugated layers (12–15) of said vertical side wall assembly have a narrow channel means factory preformed therein for receipt of a body portion of a pedestal stabilizer means (20),

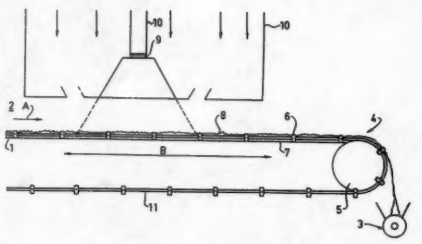
wherein said sixth layer (16) of said vertical side wall assembly (10) comprising single wall corrugated fiberboard has widened channel means factory preformed therein for receipt of flap means (21) formed on the end portion of a pedestal stabilizer means (20), said widened channel means being wider than said narrow channel means formed in said double wall corrugated layers (12–15),

wherein said pedestal stabilizer means (20) is made entirely of corrugated fiberboard material and wherein said flaps (21) formed thereon are bendable so as to allow said pedestal stabilizer means (20) to a slidably interfit with the narrow and wider channel means formed in the corrugated fiberboard layers of said vertical side wall assembly (10).

4,630,552
DEVICE AT COMBUSTION PLANTS FOR AUTOMATICAL FEEDING OF FUELS WITHIN THE FIREPLACE OF THE PLANT

Anders Lövgren, Skellefteå , Sweden, assignor to AB Megaron, Skellefteå, Sweden

Filed Sep. 16, 1985, Ser. No. 776,628
Int. Cl.[4] F23H 5/02
U.S. Cl. 110—190 **3 Claims**



1. A method for feeding solid fuel through a fireplace of a combustion plant, comprising the steps of:

positioning solid fuel on a fuel-receiving end of movable grate means,

advancing said movable grate means through said fireplace from said fuel-receiving end to a fuel-discharging end of said grate means, while combusting the fuel disposed thereon, said grate means being advanced through a sensing zone of said fireplace disposed in the vicinity of, and upstream of, said fuel-discharging end,

conducting a supply of measuring air to fuel disposed on said grate means in said sensing zone, such that the temperature of incompletely combusted fuel increases and the temperature of completely combusted fuel decreases,

sensing the temperature of the fuel in said sensing zone to obtain an indication of the extent of combustion thereof, and adjusting the rate of advance of said grate means in accordance with the sensed temperature in a manner tending to achieve a complete combustion of the fuel.

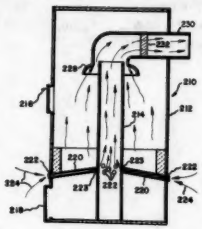
4,630,553
DUAL STAGE COMBUSTION FURNACE

Robert G. Goetzman, 519 Cayuga Ave., Niagara Falls, N.Y. 14304

Continuation of Ser. No. 634,096, Aug. 30, 1984, abandoned, which is a division of Ser. No. 501,738, Jun. 6, 1983, Pat. No. 4,484,530. This application Jan. 15, 1986, Ser. No. 819,982
Int. Cl.[4] F23B 5/00
U.S. Cl. 110—214 **9 Claims**

1. In a solid fuel burning furnace having a primary combustion chamber, said primary combustion chamber having a wall and a hollow grate supporting a bed of fuel for superheating secondary air passing there through, the improvement comprising an afterburner which comprises an exhaust pipe which extends through the wall of said chamber entirely above said bed and defines a secondary combustion chamber entirely within said primary combustion chamber, said exhaust pipe having a throat with an open end which projects into said primary combustion chamber above said bed, a tube around

said exhaust pipe defining a passage for secondary air toward the throat of said exhaust pipe, a conduit between said hollow



grate and said passage for communicating superheated air toward said throat, and ignitor means in said exhaust pipe.

4,630,554

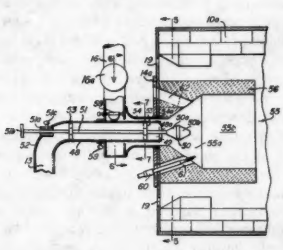
PULVERIZED SOLID FUEL BURNER AND METHOD OF FIRING PULVERIZED FUEL

William H. Sayler, Salt Lake City, and Justin C. White, Magna, both of Utah, assignors to T.A.S., Inc., Magna, Utah

Division of Ser. No. 588,900, Mar. 12, 1984, Pat. No. 4,531,461, which is a continuation-in-part of Ser. No. 378,347, May 14, 1982, abandoned, which is a continuation-in-part of Ser. No. 216,267, Dec. 15, 1980, abandoned. This application Mar. 8, 1985, Ser. No. 709,887

Int. Cl.⁴ F23D *1/02*

U.S. Cl. 110—264 **5 Claims**



1. A pulverized solid fuel burner adapted for attachment to a furnace or other heating structure, comprising means defining an ignition chamber; an elongate firing conduit having one end adapted to connect with means for supplying a stream of primary air and pulverized solid fuel and having a fuel firing orifice at the other end for discharge of a stream of the pulverized fuel and primary air that passes through said firing conduit internally and from end-to end thereof, said firing orifice being directed into said ignition chamber; a valve element movably mounted relative to said firing orifice for adjustment closer thereto or farther therefrom as a primary air and fuel feed control valve, said conduit being relatively long and longitudinally imperforate so as to confine the longitudinally extensive flow of said primary air and fuel stream therethrough; structural means within said conduit and mutually spaced along the length thereof for imparting turbulence to said longitudinally extensive flow of primary air and fuel prior to its discharge from said conduit and its entering said ignition chamber; means for introducing a controlled quantity of secondary air into the turbulent stream after its discharge through said firing orifice, said means being a conduit concentric with and surrounding said firing conduit and opening into the ignition chamber, the firing conduit being slidable longitudinally relative to the secondary air conduit and to the ignition chamber, so as to permit selective positioning of the firing orifice; means for securing said firing conduit in the selected position; means for igniting the pulverized solid fuel in said ignition chamber; means for observing conditions within said ignition chamber; and means for adjusting the position of said valve element relative to said firing orifice in accord with observed conditions in the ignition chamber to control the quantity of primary air and fuel fired into said ignition chamber and to influence flame propagation and flame shape.

4,630,555

PROCESS FOR INCINERATING WASTE PRODUCTS AT A CONTROLLED TEMPERATURE

Paul Guillaume, Ivry-sur-Seine; Didier Kayser, Paris, and Jean Propice, Bois d'Arcy, all of France, assignors to L'Air Liquide, Paris, France

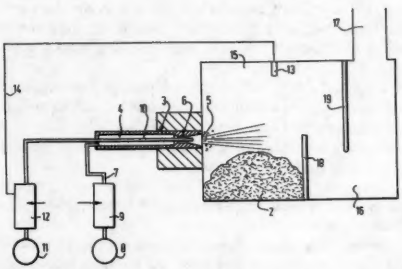
PCT No. PCT/FR85/00347, § 371 Date Mar. 20, 1986, § 102(e) Date Mar. 20, 1986, PCT Pub. No. WO86/03575, PCT Pub. Date Jun. 19, 1986

PCT Filed Dec. 3, 1985, Ser. No. 860,194

Claims priority, application France, Dec. 5, 1984, 84 18.508

Int. Cl.⁴ F23G *5/00*

U.S. Cl. 110—346 **9 Claims**



1. Process for incinerating waste products in a furnace in which a comburent and sprayed water are injected into the furnace, characterized in that the introduction of the waste products in the furnace is effected by successive charges and comprises, for each charge of waste products, the following steps:

lowering the temperature of the hearth to around 650° C.,

introducing the charge to be incinerated,

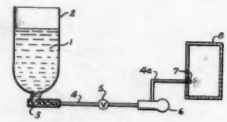
injecting oxygen at least in the zone located between the charge and 20 cm above the latter, preferably at sonic speed so as to immediately oxidize the carbon and the oxygen formed by cracking the pyrolysis gas above about 450° C., the presence of oxygen very rapidly producing a rise in temperature of the hearth above 750° C., beyond which temperature the carbon monoxide which could be possibly formed is immediately oxidized in the form of carbon dioxide, water being vaporized when the temperature in the furnace becomes higher than about 750° C., by spraying by means of oxygen in such manner, on one hand, as to produce active oxygen by thermal cracking and accelerate the oxydation of C, CO and H and, on the other hand, as to maintain a temperature in the furnace which does not become substantially higher than about 850° C., by absorption of heat upon its vaporization.

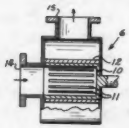
4,630,556

METHOD FOR BURNING COAL-LIQUID SLURRY FUELS AND APPARATUS THEREFOR

Robert S. Scheffee, Lorton, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Filed Feb. 17, 1982, Ser. No. 349,450
Int. Cl.[4] F23D 1/00; F23G 7/04
U.S. Cl. 110—347 20 Claims





1. A method for burning a coal/liquid fuel slurry which has been formulated to have the characteristics essential for use as a liquid fuel, including predetermined proper coal particle sizes having a maximum size smaller than that of the orifice of a given atomizing means and which, subsequent to said formulation may, at the point of use as a fuel, contain as contaminants coal particles, such as agglomerates, which are excessively sized relative to the orifice size of said atomizing means, comprising:

a. flowing said slurry fuel through a passage connected to said atomizing means and through said atomizing means into a combustion chamber;

b. positioning a comminuting means in said passage closely upstream of said atomizing means;

c. continuously passing all of said fuel in said passage through said comminuting means prior to passing into said atomizing means;

said comminuting means providing continuous passage of all said fuel therethrough and applying shear stresses sufficient to comminute said excessively-sized particles to a size smaller than said orifice.

9. Apparatus for burning a fluid coal-liquid slurry fuel which has been formulated to have the characteristics essential for use as a liquid fuel, including predetermined proper coal particle sizes having a maximum size smaller than that of the orifice of a given atomizing means and which, subsequent to said formulation may, at the point of use as a fuel, contain as contaminants coal particles, such as agglomerates, which are excessively sized relative to the orifice size of said atomizing means, comprising:

a. a combustion chamber;

b. atomizing means for said fuel opening into said chamber, said atomizing means having an orifice of given size to permit passage therethrough of said predetermined proper particle sizes;

c. a passage for said fuel connected to said atomizing means;

d. comminuting means positioned in said passage closely upstream of said atomizing means in such manner that all of said fuel flowing through said passage passes through said comminuting means;

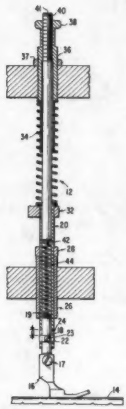
said comminuting means providing continuous passage therethrough of all of said fuel and applying shear stresses sufficient to comminute said excessively sized particles to a size smaller than said orifice.

4,630,557

ADJUSTABLE LOW INERTIA PRESSER BAR

Angus R. T. Russell, Englishtown, N.J., assignor to The Singer Company, Stamford, Conn.

Filed May 14, 1981, Ser. No. 263,623
Int. Cl.[4] D05B 29/02
U.S. Cl. 112—235 2 Claims



1. A presser mechanism for a sewing machine having a frame including a head overlying a work support, said mechanism comprising a hollow main presser bar slidably supported by said head, a first force adjusting member carried by said head coaxial with said main presser bar, a first resilient means acting between said first force adjusting member and said main presser bar for urging said main presser bar towards said work support, a low inertia presser bar internally supported in the lower end of said hollow main presser bar, a presser foot attached to the end of said low inertia presser bar for engagement with work material supported on said work support, a second adjusting member supported coaxially with said first adjusting member, a second resilient means supported internally of said main presser bar and extending between said second adjusting member and said low inertia presser bar, and means for selectively limiting the travel of said low inertia presser bar whereby said main presser bar and said first resilient means may be brought into operation after a selected travel of said low inertia presser bar, said limiting means including a collar adjustably supported on said main presser bar, said collar limiting motion of said main presser bar through said head toward said work support.

4,630,558

TUFTING MACHINE AND METHOD OF TUFTING FOR PRODUCING MULTIPLE ROWS OF TUFTS WITH SINGLE LENGTHS OF YARN

Roy T. Card, 4012 Creekwood Ter., Chattanooga, Tenn. 37421, and Joseph L. Card, 1515 Edgewood Cir., Chattanooga, Tenn. 37405

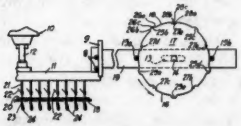
Continuation of Ser. No. 496,010, May 19, 1983, Pat. No. 4,440,102. This application Mar. 22, 1984, Ser. No. 592,384
The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.
Int. Cl.[4] D05C 17/02, 15/30
U.S. Cl. 112—266.2 7 Claims

1. Method of producing a tufted product wherein the backing material is progressively moved along a path, passing between reciprocating needles on one side of the backing material and reciprocating loopers on the other side of the backing material, the needles in their reciprocation being moved toward the loopers in a yarn inserting stroke and away

from the loopers during a needle retracting stroke, the needles being free of the backing material when the needles are retracted, the needles having ends which are sufficiently pointed that they will engage and penetrate the backing material when the needles are moved from their retracted position toward the loopers, and yarns are supplied to the needles so that the needles carry the yarns through the backing material during the movement of the needles toward the loopers, the lengths of the yarn inserting strokes of the needles being sufficient for the yarns to form loops of the yarn which protrude from the other side of the backing material after the needles have penetrated the backing material, the loopers having hook portions which are inserted, in a loop engaging action, through the loops carried by the needles when the needles are adjacent to the loopers, and the loopers temporarily holding the loops as the needles are retracted out of the backing material, the improvement comprising:

(a) moving the needles laterally after the needles have engaged the backing material, for shifting a transverse portion of the backing material laterally of its normal path;

(b) then, continuing the movement of the needles so as to position the loops being inserted by the needles respectively for the loop engaging action of the loopers; and



(c) thereafter, withdrawing the needles from said backing material to release the portion of the backing material which was shifted.

6. A tufting machine having a reciprocating needle bar, a plurality of spaced parallel needles carried by the needle bar for reciprocation by the needle bar toward any away from loopers and wherein backing material is passed between the needles and the loopers so that successive lengths of yarn carried by the respective needles are inserted from one side through successive transverse increments of the backing material to form tufts protruding from the other side of the backing material and wherein the loops when inserted by the needles are respectively caught and held and subsequently released by the loopers, the needles being withdrawn from the backing material as they are moved by the needle bar away from the loopers, the improvement comprising:

(a) means for shifting the needle bar laterally while the needles are withdrawn from the backing material; and

(b) said means also shifting said needles laterally after the needles have penetrated the backing material and prior to the time the loopers engage and hole the loops of yarn, whereby the needles move the increment of backing material, through which the needles project, laterally and the needles release this increment of backing material when the needles are withdrawn therefrom.

4,630,559

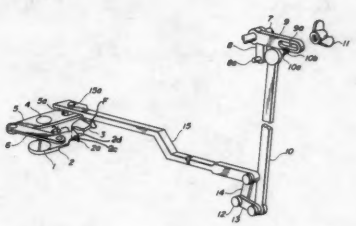
THREAD CUTTING MECHANISM IN LOCK STITCH SEWING MACHINE

Tomoaki Kinoshita, Kanagawa, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

Filed Oct. 30, 1984, Ser. No. 666,485

Int. Cl.[4] D05B *65/02*

U.S. Cl. 112—291 1 Claim



1. A thread cutting mechanism for a lock stitch sewing machine comprising;

a stationary blade fixedly secured to the framework of said sewing machine;

a movable blade for reciprocal movement between initial and operative positions and having a thread handling portion formed at the leading edge of said movable blade for initially engaging threads attached to a work piece being sewn as the blade moves from an initial to an operative position and passing said threads to a guide portion formed at the outer edge of the blade whereby said threads when said blade moves to an operative position are caused to slide off said guide portion and lie adjacent a thread arresting portion of said blade, whereby said arresting portion traps the threads upon the return reciprocal movement of the blade to its initial position to cause said threads to be cut by the relative movement between said movable and stationary blades;

operation means operatively connected to said movable blade for causing the movable blade to move reciprocally when said operation means is actuated wherein the improvement comprises adjusting means operatively associated with said operation means for adjusting the distance the blade reciprocates between said initial and operative positions to ensure that said threads will slide off said guide portion upon said return movement of the blade to its initial position.

4,630,560

DEVICE FOR STABILIZING THE NEEDLE THREAD LOOP IN SEWING MACHINES

Klaus Stutznäcker, Frechen-Königsdorf, Fed. Rep. of Germany, assignor to Nahmaschinenfabrik Emil Stutznacker GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Filed Oct. 2, 1980, Ser. No. 192,963

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1979, 2939888

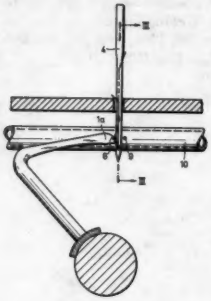
Int. Cl.[4] B65H *57/24;* D05B *57/00*

U.S. Cl. 112—302 6 Claims

6. A device for stabilizing a needle thread loop in the area of a looper in sewing machines having at least one needle for forming a needle thread loop on one side thereof, comprising:

two compressed air nozzles for each needle which are positioned on the opposite side of the associated needle facing away from the needle thread loop and which are oriented in such a manner that the compressed air streams emanating therefrom meet in a converging manner and are directed toward the area of the needle thread loop, said

compressed air nozzles being spaced apart from each other and from said needle and being located on opposite



sides of a vertical plane passing through the center of said one side and said opposite side of needle.

4,630,561

SHIP HAVING STANDARDIZED ACCESS WAYS

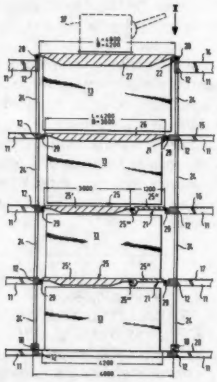
Hans-Joachim Franz, Kölln-Reisiek; Willy Schmidt, Ellerbek, and Karl O. Sadler, Hamburg, all of Fed. Rep. of Germany, assignors to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 580,611, Feb. 16, 1984. This application Mar. 27, 1985, Ser. No. 716,566

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1984, 3411299

Int. Cl.[4] B63G *1/00*; B63B *3/00*

U.S. Cl. 114—1 **29 Claims**



1. In a ship having a plurality of vertically spaced decks and a ship bottom within a hull, said decks comprising an uppermost deck and lower decks, said hull having a longitudinal direction and a transverse direction, an assembly arrangement for equipment and apparatus, said arrangement comprising:

a plurality of substantially horizontal load bearing elements comprising a plurality of longitudinal members substantially parallel to said longitudinal direction and a plurality of transverse members transverse to said longitudinal members, substantially parallel to said transverse direction, said longitudinal members and said transverse members supporting said plurality of decks;

at least a substantial portion of said longitudinal members defining a plurality of vertical longitudinal planes and being disposed in said longitudinal planes;

at least a substantial portion of said transverse members defining a plurality of vertical transverse planes and being disposed in said transverse planes;

said vertical planes forming substantially horizontal rectangles on each deck and said bottom;

said horizontal load bearing elements being disposed such that at least some of said horizontal rectangles are disposed one above the other and aligned vertically;

said horizontal rectangles being disposed one above another for forming a plurality of adjacent vertical groups of rectangles, having rectangles within each said group aligned vertically one above another;

vertical access ways being disposed in at least some of sAid vertical groups of rectangles;

each of said access ways comprising access openings in said uppermost deck and at least in some of said lower decks in each corresponding vertical group;

an uppermost of said access openings of each said access way being at least as large as a lower one of said access openings in said corresponding access way in its corresponding vertical group;

second deck access openings of said access openings being directly under an uppermost of said openings of each of said vertical access ways in its corresponding vertical group;

said second deck access openings having means for receiving a water tight cover; and

said uppermost of said access openings having a watertight load-bearing cover and an apparatus installed on said watertight cover, at least some of said lower deck access openings being provided with watertight load-bearing covers and including equipment bearing containers installed on at least some of said covers.

4,630,562

ADJUSTABLE MAST STEP

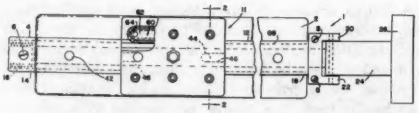
Richard W. Grant, and Ronald D. Sciulli, both of Honolulu, Hi., assignors to Atecs Corporation, Honolulu, Hi.

Continuation of Ser. No. 490,472, May 2, 1983, Pat. No. 4,527,499. This application Dec. 17, 1984, Ser. No. 682,189

The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.

Int. Cl.[4] B63H *9/06*

U.S. Cl. 114—39 **17 Claims**



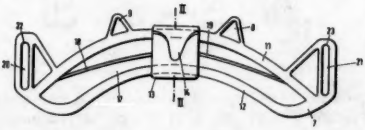
1. Adjustable apparatus comprising track means, connecting means connected to the track means for connecting the tract means to a sailboard on which the adjustable apparatus is to be mounted, traveler means connected to the track means for moving along the track means, and detent means movable through the track means into the traveler means for securing the traveler means in a selected position on the track means, wherein the detent means further comprises slider means connected to the track means for sliding adjacent the track means, and wherein the detent means further comprises abutment means mounted in the track means and wherein the slider means further comprises receiver means for receiving the abutment means, whereby the abutment means may be moved into the receiver means and out of contact with the traveler means.

4,630,563

TRAPEZE BELT OR HARNESS FOR WINDSURFING

Siegried Pertramer, Ferdinand-Miller-Strasse 11, D-8080 Fürstenfeldbruck, Fed. Rep. of Germany

Filed Nov. 21, 1984, Ser. No. 673,808
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 3342526; Sep. 17, 1984, 3434087
Int. Cl.[4] B63H 9/04
U.S. Cl. 114—39 17 Claims



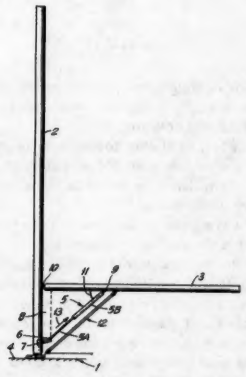
1. A trapeze belt device for windsurfing which comprises:
(a) a belt means worn by the body of a user in the chest region;
(b) a rigid holding and spreading means secured to said belt means for wearing across the lower front chest of the user;
(c) a carriage on said belt means and mounted for movement along said holding and spreading means; and
(d) a hook on said carriage adapted for engagement with lines secured to both sides of a wishbone boom of a windsurfer.

4,630,564

BOOM CONTROL DEVICE FOR A SAILBOAT BOOM

Donald Duckman, Brunnsgatan 9; Curt Duckman, Oslovägen 41, both of 452 00 Strömstad, and Kjell Andrén, Dr Südows gata 28, 431 24 Göteborg, all of Sweden

PCT No. PCT/SE83/00150, § 371 Date Dec. 22, 1983, § 102(e) Date Dec. 22, 1983, PCT Pub. No. WO83/03806, PCT Pub. Date Nov. 10, 1983
Continuation of Ser. No. 571,546, Dec. 22, 1983, abandoned.
This PCT application Apr. 21, 1983, Ser. No. 778,754
Claims priority, application Sweden, Apr. 23, 1982, 8202555
Int. Cl.[4] B63H 9/10
U.S. Cl. 114—98 6 Claims



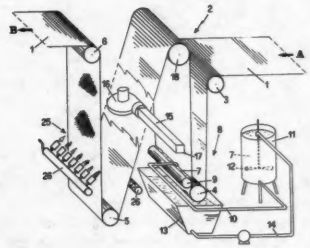
1. A boom control device for a sail boat having a mast, a mounting projecting from the mast, and a boom pivotally connected to said mounting and to be connected to a sail; said boom control device comprising: a unit having two sections, a first pivot directly connecting one section to said boat rearwardly of said mounting as viewed in the longitudinal direction of the boat to be spaced from said boom rearwardly of said boat, and a second pivot directly connecting the other section to said boom, said two sections forming a spring element such that the device urges the boom to swing out transversely across the boat from the longitudinal direction thereof and resists swinging back to the longitudinal direction, said device extending at a first angle in a vertical plane with respect to said boom and at a second angle in a horizontal plane when swung out across the boat, said spacing and angles being set so that urging force exerted on said boom by said spring element is maximum when the boom is oriented transversely of the longitudinal centerline of the boat and decreases to a minimum when the boom is oriented to extend along the longitudinal centerline of the boat.

4,630,565

EQUIPMENT FOR UNIFORMLY SPREADING ANTI-STICKING POWDERS ON BITUMINOUS MEMBRANES FOR BUILDING COVERINGS

Silvio Olioso, Castel d'Azzano, Italy, assignor to Index S.p.A. Technologie Impereabili, Italy

Filed Jan. 16, 1986, Ser. No. 819,900
Claims priority, application Italy, Dec. 13, 1985, 84975 A/85
Int. Cl.[4] B05C 3/172, 11/06
U.S. Cl. 118—47 6 Claims



1. An equipment for uniformly spreading anti-sticking powders on bituminous membranes for building coverings, of the kind using anti-sticking powders in an aqueous suspension and comprising a series of rotating rollers on which the bituminous membrane provided with a continuous feed motion runs and further comprising a station in which the aqueous suspension is applied to the membrane as well as a drying station, wherein, downstream of the suspension-applying station and upstream of the drying station relative to the membrane feed direction, provision is made for a rotating drum on which the membrane runs, said rotating drum having its cylindrical surface disposed in contact with the membrane, provided with shaped reliefs, and wherein, downstream of the suspension-applying station and upstream of said rotating drum provision is also made for a compressed air duct placed in the vicinity of the membrane transversely to the feed direction of the latter and provided with a longitudinal slit turned towards the membrane surface so that it generates a flattened air jet adapted to eliminate the liquid in excess on the membrane and to form a liquid film thereon.

4,630,566

MICROWAVE OR UHF PLASMA IMPROVED APPARATUS

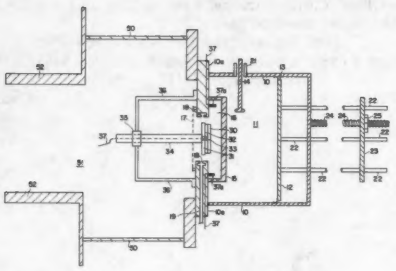
Jes Asmussen, Okemos, and Donnie K. Reinhard, East Lansing, both of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Division of Ser. No. 641,190, Aug. 16, 1984, Pat. No. 4,585,668.
This application Nov. 15, 1985, Ser. No. 798,309
Int. Cl.[4] C23C 13/08; H01J 7/46
U.S. Cl. 118—50.1 4 Claims

1. An ion generating apparatus for treating a surface which comprises:

(a) a plasma source employing a radio frequency, including UHF or microwave, wave coupler which is metallic and in the shape of a hollow cavity and which is excited in one or more of its TE or TM modes of resonance and optionally including a static magnetic field surrounding the plasma source which aids in coupling a electron cyclotron resonance and aids in confining the ions in the coupler, wherein the plasma is maintained at a reduced pressure in operation and wherein the ion source apparatus includes an electrically insulated chamber having a central longitudinal axis mounted in closely spaced relationship to an area of the coupler;

(b) gas supply means for providing a gas which is ionized to form the plasma in the insulated chamber, wherein the radio frequency wave applied to the coupler creates and maintains the plasma in the shape of an elongate plasma



disk perpendicular to and surrounding the central longitudinal axis in the chamber;

(c) movable metal plate means in the cavity mounted perpendicular to the axis and movable towards and away from the chamber;

(d) a movable probe connected to and extending inside the coupler for coupling the radio frequency waves to the coupler, wherein movement of the plate means and the probe in the coupler achieves the selected TE or TM mode of resonance of the radio frequency wave in the coupler and varies the resonance of the mode;

(e) ion attracting means for attachment to the surface to be treated for attracting ions from the plasma to the surface by means of a suitable voltage potential; and

(f) a platform supporting the surface to be treated and electrically insulated from the ion attracting means.

4,630,567

SPRAY PAINT SYSTEM INCLUDING PAINT BOOTH, PAINT ROBOT APPARATUS MOVABLE THEREIN AND RAIL MECHANISM FOR SUPPORTING THE APPARATUS THEREOUT

Gerald J. Bambousek, Algonac; Donald S. Bartlett, and Thomas D. Schmidt, both of Troy, all of Mich., assignors to GMF Robotics Corporation, Troy, Mich.

Filed Aug. 28, 1985, Ser. No. 770,261

Int. Cl.[4] B05B *15/12*

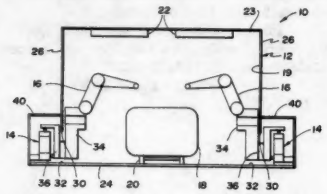
U.S. Cl. 118—323 **15 Claims**

1. A spray paint system comprising:

a paint booth having walls defining an enclosed painting area;

at least one track means located outside of said painting area and in fluid communication therewith through at least one opening formed in said paint booth;

at least one paint robot located within said painting area to paint a body disposed therein, said paint body robot being movably supported on said track means outside of the painting area; and



sealing means for sealing said painting area at said opening, said sealing means including at least one labyrinthian seal.

4,630,568

APPARATUS FOR COATING SUBSTRATES BY PLASMA POLYMERIZATION

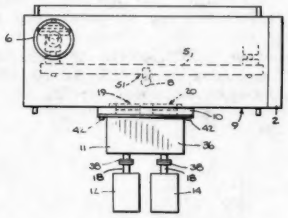
Jörg Kieser, Albstadt, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 716,513, Mar. 26, 1985, abandoned, which is a continuation of Ser. No. 556,847, Dec. 1, 1983, abandoned. This application May 21, 1985, Ser. No. 736,556

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244391

Int. Cl.[4] C23C *16/00*

U.S. Cl. 118—723 **11 Claims**



1. Apparatus for coating substrates by means of a reaction for depositing atoms or molecules which is initiated by a plasma, which apparatus comprises:

a reaction chamber, including means for transporting the substrates, for containing an atmosphere comprising ionized gas and comprising, in one of its walls, two windows penetrable by microwaves;

one or more wave-gude structures disposed outside said chamber and in front of said windows;

means for distributing gas in said chamber; and

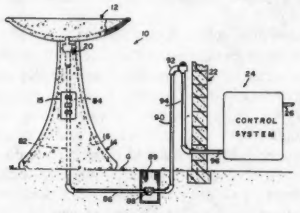
a support frame at said reaction chamber, said support frame being of rectangular shape and comprising said two windows which extend parallel to the longer sides of the rectangle and a frame strut between said two windows, the apparatus also comprising cooling ducts, beside said windows, in said support frame, said distributing means being at least partially disposed in said frame strut;

said windows, penetrable by microwaves, said one or more wave-guide structures and said distributing means being secured jointly to said support frame and said support frame being secured to said reaction chamber in such manner that said windows, said one or more wave-guide structures, said distributin means and said support frame are displaceable from said reaction chamber as a unit.

4,630,569
SELF-CLEANING BIRDBATH APPARATUS

Lawrence A. Dieleman, 2119 Tulip La., Jenison, Mich. 49428

Filed May 2, 1985, Ser. No. 729,979
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 31 Claims



15. A birdbath assembly for controlled automatic filling, self-cleaning and emptying with water pressure comprising:

a bowl for receiving and holding a quantity of water, said bowl having an inner surface and a top edge;

means for supporting said bowl;

a spray nozzle mounted for movement through the inside surface of said bowl, said spray nozzle adapted to fill said bowl with water, agitate the water and any effluents therein, empty said bowl of any water and effluents, and refill said bowl;

fluid responsive means for moving at least a portion of said spray nozzle through said inside bowl surface to a position within said bowl in response to water pressure to direct water spray for agitation of water within said bowl and subsequent removal of the water and effluents from the bowl;

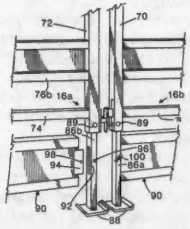
said spray nozzle including water spraying means for spraying water toward and/or against said inside surface of said bowl during movement of said spray nozzle into said bowl and for spraying water over said top edge of said bowl and out of said bowl while said spray nozzle is in said position within said bowl; and

connection means for connecting said spray nozzle with a source of water under pressure.

4,630,570
PORTABLE STOCK HANDLING UNIT

James A. Wilson, Bacchus Marsh, and James R. Ellis, Melton, both of Australia, assignors to Holland Hitch Company, Holland, Mich.

Division of Ser. No. 667,451, Nov. 1, 1984, Pat. No. 4,569,309, which is a division of Ser. No. 627,072, Jul. 2, 1984, abandoned, which is a division of Ser. No. 416,302, Sep. 9, 1982, abandoned.
This application Nov. 1, 1985, Ser. No. 793,904
Int. Cl.[4] A01K *3/00*
U.S. Cl. 119—20 5 Claims



1. A portable stock race and yard comprising:

said stock race having a body and wheels supporting said body for transport;

a plurality of wings swingably connected to said stock race body and arranged to be folded out to form at least part of the periphery of a stockyard, each of said wings being connected to said stock race sufficiently high to pass over said wheels of said stock race when said wings are folded against the body of said stock race;

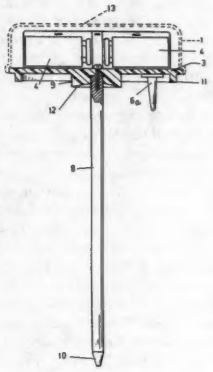
a plurality of legs supporting said wings when said wings are folded out to form said stockyard; and

a plurality of panel sections, one each releasably securable under one of said wings and between two of said legs, said panel sections being secured to said legs under said wings when said wings are folded out to form said stockyard to prevent stock from passing under said wings, said panel sections being removed from said legs when said wings are folded against said stock race to permit said wings to pass over the wheels of said race.

4,630,571
DEVICE TO REACTION TRAIN ANIMALS

Robert S. Palmer, 20 Dolly Avenue, Gosford, New South Wales, 2250, Australia

Filed Sep. 30, 1985, Ser. No. 781,689
Int. Cl.[4] A01K *15/02*
U.S. Cl. 119—29 3 Claims



1. A device to reaction train animals to avoid an area where the device is located, the device comprising a housing body made of electrically non-conductive material, a housing cover made of electrically conductive material mounted over the body to provide a watertight compartment therebetween, dry cell battery mounting means in the compartment having positive and negative terminals, an electrically conductive contact fixed to the housing body within the compartment and engaged by the housing cover, an electrically conductive earthing post fixed to and projecting from the underside of the housing body, a switch mounted in the compartment, an operating member to connect and disconnect two terminals of the switch, an electrical connection between one terminal of the battery mounting means and one terminal of the switch means, a second electrical connection between the other terminal of the battery mounting means and the earthing post and a third electrical connection between the contact engaged by the housing cover part and the second terminal of the switch means, and a continuous moisture barrier means projecting from the underside of the housing body and encircling the earthing post to interrupt a direct moisture path between the housing cover and the earthing post.

4,630,572

BOILING LIQUID COOLING SYSTEM FOR INTERNAL COMBUSTION ENGINES

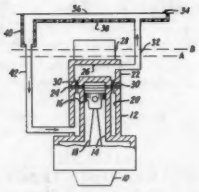
John W. Evans, Sharon, Conn., assignor to Evans Cooling Associates, Sharon, Conn.

PCT No. PCT/US83/01775, § 371 Date Jun. 13, 1984, § 102(e) Date Jun. 13, 1984, PCT Pub. No. WO84/01979, PCT Pub. Date May 24, 1984

Continuation-in-part of Ser. No. 442,721, Nov. 18, 1982, abandoned. This PCT application Nov. 14, 1983, Ser. No. 625,919

Int. Cl.[4] F01P 3/22

U.S. Cl. 123—41.21 14 Claims



1. A cooling system for an internal combustion engine, the engine including a coolant jacket, and having a condenser and conduit means for conducting coolant vapor from substantially the highest zone in the coolant jacket to the condenser and for returning coolant condensate to the coolant jacket characterized in that the coolant is a high molecular weight organic liquid having a saturation temperature at atmospheric pressure of not less than about 132° C. (270° F.), a molar heat of vaporization at atmospheric pressure of greater than about 9,800 cal/mole and a surface tension at 15° C. (59° F.) of less than about 70 dynes/cm.

6. A boiling liquid cooling process for internal combustion engines in which coolant vapor is conducted from substantially the highest zone in the engine coolant jacket to a condenser, is condensed and the condensate is returned from the condenser to the engine, characterized by the step of under all operating conditions of the engine supplying coolant exclusively in a liqud state substantially free of vapor to the coolant jacket of the engine head such that the major part of the head coolant jacket is kept filled with coolant in the liquid phase at all times, the coolant being a boilable organic liquid having a saturation temperature at atmospheric pressure of not less than about 132° C. (270° F.), a molar heat of vaporization at atmospheric pressure of greater than about 9,800 cal/mole and a surface tension at 15° C. (59° F.) of less than 70 dynes/cm.

4,630,573

COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE

Naoki Ogawa, Yokohama; Takao Kubozuka, Yokosuka, and Yoshinori Hirano, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 23, 1985, Ser. No. 779,395

Claims priority, application Japan, Sep. 29, 1984, 59-202950

Int. Cl.[4] F01P 3/22

U.S. Cl. 123—41.27 10 Claims

1. In an internal combustion engine having a structure subject to high heat flux, a cooling system comprising:

(a) a cooling system for removing heat from said structure, said cooling system comprising:

a coolant jacket disposed about said structure and into which coolant is introduced in liquid form and permitted to boil;

a radiator in which coolant vapor is condensed to its liquid form;

a vapor transfer conduit leading from a vapor collection spaced defined in said coolant jacket to said radiator;

means for returning liquid coolant from said radiator to said coolant jacket in a manner which maintains said structure immersed in a predetermined depth of liquid coolant, said liquid coolant returning means including:

a coolant return conduit leading from the bottom of said radiator to said coolant jacket, and

a pump disposed in said coolant return conduit, said pump being selectively energizable to return coolant from said radiator to said coolant jacket through said coolant return conduit;

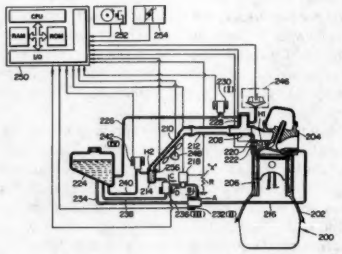
(b) a reservoir in which liquid coolant is stored;

(c) valve and conduit means for selectively providing fluid communication between said reservoir and said cooling circuit, said valve and conduit means comprising:

a first valve disposed in said coolant return conduit at a location between said radiator and said pump, and

a first conduit leading from said reservoir to said valve, said first valve having a first position wherein communication between said radiator and said pump is established and communication between said pump and said first conduit cut-off, and a second position wherein communication between said radiator and said pump is cut-off and communication between said reservoir and said pump is established via said first conduit; and

means for sensing the load on said pump when energized and for causing said first valve to assume said first position



when the load on the pump is above a predetermined minimum limit and for causing said first valve to assume said second position in response to the load on said pump being equal to or lower than said predetermined minimum level.

10. In an internal combustion engine having a structure subject to high heat flux, a method of cooling said engine comprising the steps of:

introducing liquid coolant into a coolant jacket disposed about said structure;

permitting said coolant to boil and produce coolant vapor;

condensing the coolant vapor produced in said coolant jacket to its liquid form in a radiator;

using a pump to return the liquid coolant from said radiator to said coolant jacket in a manner which maintains said structure immersed in a predetermined depth of coolant;

storing liquid coolant in a reservoir;

sensing the load on said pump when energized; and

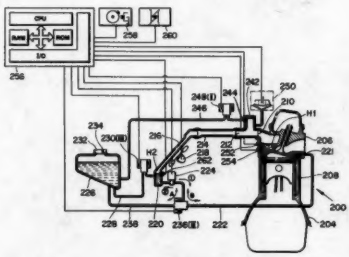
interrupting the communication between said radiator and said pump and establishing fluid communication between said reservoir in which liquid coolant is stored and said pump in response to said step of sensing indicating that the load on said pump is equal to or lower than a predetermined minimum limit.

4,630,574

COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE

Yoshinori Hirano, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 27, 1985, Ser. No. 780,908
Claims priority, application Japan, Sep. 29, 1984, 59-202932
Int. Cl.[4] F01P 3/22
U.S. Cl. 123—41.27 5 Claims



1. In an internal combustion engine having a structure subject to high heat flux;

a cooling circuit for removing heat from said engine comprising:

a coolant jacket formed about said structure, said coolant jacket being arranged to receive coolant in liquid form and discharge same in gaseous form;

a radiator in which the gaseous coolant produced in said coolant jacket is condensed to its liquid form;

a vapor transfer conduit leading from said coolant jacket to said radiator for transfering gaseous coolant from said coolant jacket to said radiator;

a device associated with said radiator for varying the rate of heat exchange between said radiator and a cooling medium surrounding the radiator;

a liquid coolant return conduit leading from said radiator to said coolant jacket for returning coolant condensed to its liquid state in said radiator to said coolant jacket;

a reservoir the interior of which is maintained constantly at atmospheric pressure;

valve and conduit means for selectively interconnecting said reservoir and said cooling circuit, said valve and conduit means including a three-way valve disposed in said return conduit and a level control conduit leading from said three-way valve to said reservoir, said three-way valve having a first state wherein fluid communication between said radiator and said coolant jacket is interrupted and communication between said radiator and said reservoir established, and a second state wherein communication between said reservoir and said radiator is interrupted and communication between said radiator and said coolant jacket established;

a reversible pump disposed in said coolant return conduit at a location between said radiator and said three-way valve, said pump being selectively energizable to pump coolant in (a) a first flow direction from said radiator toward said three-way valve and (b) in a second flow direction from said three-way valve toward said radiator;

a first sensor for sensing a parameter which varies with the temperature of the liquid coolant in said coolant jacket;

a second sensor for sensing a parameter which varies with the load on the engine; and

a control circuit responsive to said first and second sensors for controlling the operation of said device, said valve and conduit means and said pump, said control circuit including means for:

defining a control schedule in terms of engine speed and load, said schedule including:

a first low speed/low load zone wherein the temperature to which the coolant should be controlled is set within a first range;

a second low speed/high load zone wherein the temperature to which the coolant should be controlled is set within a second range which is lower than the first rangennd;

a third high speed zone wherein the temperature to which the coolant should be controlled is set within a third range intermediate of the first and second ranges;

determining which of said first, second and third zones the engine is operating;

operating said device in a manner to vary the rate of condensation in said radiator and bring the temperature of the coolant in said coolant into the temperature range of the zone in which the engine is being operated; and

operating said three-way valve and said pump in a manner to vary the amount of coolant in said cooling circuit and therefore modify the pressure prevailing in said cooling circit in a manner which tends to bring the temperature of the coolant into the temperature range of the zone in which the engine is operating.

5. A method of cooling an internal combustion engine comprising the steps of:

introducing liquid coolant into a cooling circuit which includes a coolant jacket formed about structure of the engine subject to high heat flux;

permitting the coolant in said coolant jacket to boil and produce coolant vapor;

transferring the coolant vapor to a radiator which defines a further section of said cooling circuit;

condensing the coolant to its liquid form in said radiator;

sensing operational parameters of said engine;

sensing the temperature of the coolant in said coolant jacket;

using a control schedule which includes:

a first low speed/low load zone in which the coolant temperature should be maintainied in a first temperature range;

a second low speed/high load zone in which the temperature of the coolant should be maintained in a second temperature range which is higher than the first range; and

a third high speed zone in which the temperature of the coolant should be maintained in a third range intermediate of the first and second ranges;

determing which of the first, second and third zones the engine is operating;

using a device located externally of said radiator to vary the rate of heat exchange beteen the radiator and a cooling medium surrounding said radiator in a manner which tends to bring the temperature of the coolant in the coolant jacket into range of the mode determined in said mode determining step; and

using a reversible pump to pump coolant into and out of said cooling circuit in a manner which varies the pressure prevailing therein and which tends to bring the temperature of the coolant in said coolant jacket into the range of the mode determined in said mode determining step.

4,630,575

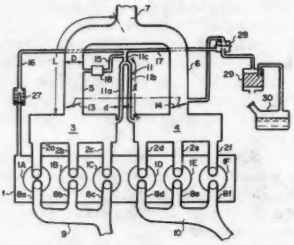
INTAKE SYSTEM FOR MULTICYLINDER ENGINE

Koichi Hatamura, and Tetsuo Hiraoka, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 22, 1985, Ser. No. 768,343
Claims priority, application Japan, Aug. 27, 1984, 59-177791; Jan. 14, 1985, 60-4670
Int. Cl.[4] F02B 27/02
U.S. Cl. 123—52 M 17 Claims

1. An intake system for a multicylinder engine in which discrete intake passage portions immediately connected to the respective cylinders are divided into two groups so that intake timings of the discrete intake passage portions in each group are not immediately successive, and the discrete intake passage portions in each group are concentrated to form a concentrated portion, branch intake passage portions extending upstream from the concentrated portions for the both groups and

being integrated with each other to form a main intake passage portion, wherein the improvement comprises a fluid introduction passage for introducing at least one desired fluid into the cylinders, the fluid introduction passage comprising a main introduction passage portion connected to a source of the desired fluid at its upstream end portion and a pair of branch introduction passage portions connected to the respective branch intake passage portions or concentrated portions at their downstream ends and to the downstream end of the main introduction passage portion at their upstream ends, the fluid introduction passage being provided with a flow control valve means for controlling the flow of the fluid passing there-



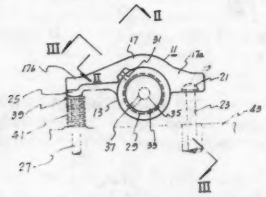
through at a portion upstream of the junction of the branch introduction passage portions to the main introduction passage portion, the diameter and the average length of the branch introduction passage portions satisfying the condition $d/\sqrt{l} < D/\sqrt{L}$ so that the air column in the branch introduction passage portions resonates at a lower frequency than the air column vibration system in the intake passage upstream of the concentrated portions wherein D and d respectively represent the diameters of the branch intake passage portions and the branch introduction passage portions, and L and l respectively represent the average lengths of the branch intake passage portions and the branch introduction passage portions.

4,630,576

INTAKE VALVE ROCKER ARMS OF CERTAIN SIX CYLINDER INTERNAL COMBUSTION ENGINES

Kenneth W. Raymond, 956 E. Seminole Dr., Venice, Fla. 33595

Filed May 15, 1985, Ser. No. 734,042
Int. Cl.[4] F01M 9/10
U.S. Cl. 123—90.36 **3 Claims**



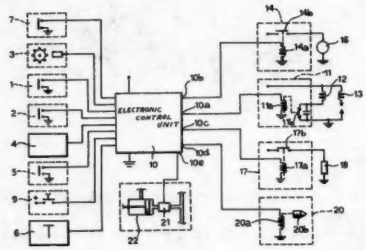
1. in an internal combustion engine wherein rocker arms coact with the top of the valve stems of intake valves therein and wherein each one of said rocker arms has an internal peripheral groove that conveys lubricating oil through a radially extending passage in said rocker arm so that lubricating oil flows into the top of the intake valve stems, the improvements in said rocker arm comprising means for sealing said radial passage in said rocker arm in such a way that lubricating oil does not flow through said radial passage onto said intake valve stem.

4,630,577

STOP-START DEVICE FOR CONTROLLING THE OPERATION OF AN INTERNAL COMBUSTION ENGINE OF A VEHICLE PROVIDED WITH AN AUTOMATIC TRANSMISSION

Felice Cornacchia, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Mar. 26, 1985, Ser. No. 716,055
Claims priority, application Italy, Mar. 26, 1986, 67289 A/84
Int. Cl.[4] F02N 11/08
U.S. Cl. 123—179 B **8 Claims**



1. A stop-start device for controlling the operation of an internal combustion engine of a motor vehicle provided with a brake pedal, an accelerator pedal, an electric starter motor and, an automatic transmission, comprising:

sensor means operable to provide electrical signals indicative of the speed of the vehicle, the speed of rotation of the engine, and the position of the accelerator pedal,

actuator means arranged, respectively when activated and deactivated, to cause the engine to be turned off and to allow starting thereof, and

an electronic monitoring and control unit connected to the said sensor means, to the actuator means and to the electric starter motor of the engine; the said unit being arranged

to activate the said actuator means whenever the signals provided by the said sensor means indicate that for a period of time of predetermined duration the speed of rotation of the engine is less than a first predetermined value, the speed of the vehicle is less than a predetermined threshold, and the accelerator pedal is released, and

to deactivate the said actuator means and automatically activate the electric starter motor when the signals provided by the said sensor means indicate that the speed of rotation of the engine is lower than a second predetermined value, less than the said first value, and the accelerator pedal is depressed, wherein the said sensor means are arranged to provide further electrical signals indicative of the position of the brake pedal, and in that the said electronic monitoring and control unit is arranged to activate the said actuator means whenever the signals provided by the said sensor means indicate that for a period of time of predetermined duration, the speed of rotation of the engine is less than the said first predetermined value, the speed of the vehicle is less than the said threshold value and the brake pedal and the accelerator pedal are both released.

4,630,578

APPARATUS FOR CONTROLLING THE POSITION OF A THROTTLE DEVICE DISPOSED IN THE INTAKE TUBE OF AN INTERNAL COMBUSTION ENGINE

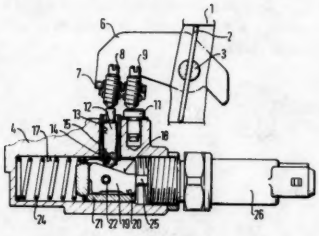
Hermann Nusser, Markgröningen, and Klaus-Jürgen Peters, Affalterbach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 11, 1985, Ser. No. 753,840

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441404

Int. Cl.[4] F02D 9/02

U.S. Cl. 123—179 G 6 Claims



1. An apparatus comprising a housing, a portion of an intake tube of an internal combustion engine and means for controlling positioning of a throttle device disposed in the intake tube, said throttle device being rotatably supported in said intake tube by means of a shaft, said shaft further arranged to engage a lever, said lever adapted to be actuated by an expansion element, said expansion element further including a control body having a cam track, said cam track being displaceable counter to a force applied by a restoring spring and a feeler pin displaceably supported in the housing arranged to engage said cam track whereby said lever actuates said throttle device.

4,630,579

INTERNAL COMBUSTION ENGINE

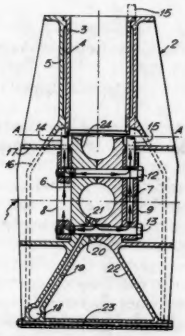
Graham E. Atkin, Kennilworth, United Kingdom, assignor to Austin Rover Group Limited, Coventry, United Kingdom

Filed Nov. 28, 1984, Ser. No. 675,878

Claims priority, application United Kingdom, Dec. 2, 1983, 8332315; Jul. 31, 1984, 8419493

Int. Cl.[4] F02F 7/00

U.S. Cl. 123—195 R 10 Claims



1. An internal combustion engine comprising a cylinder head, a plurality of cylinders and a cylinder block containing rigidly secured thereto crankshaft bearings, housing for each crankshaft bearing is in two halves which meet in a plane containing the axes of the cylinders which are adjacent to each other, a respective yoke is provided on opposite outer sides of each bearing housing for holding each pair of bearing housing halves together, and tensile members are provided for securing the cylinder head to the cylinder block, which tensile members extend to and are secured to the yokes, wherein each yoke includes clamping members extending in generally in a direction same as the tensile members and fasteners transverse to said clamping members which clamp the clamping members together.

4,630,580

OIL PASSAGE USABLE FOR AN ENGINE

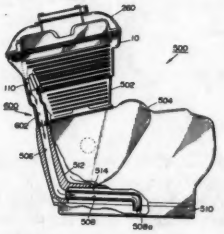
Yasushi Sawaki; Hironori Iguchi, and Tateshi Shimizu, all of Shizuoka, Japan, assignors to Suzuki Motor Co., Ltd., Japan

Filed Sep. 12, 1985, Ser. No. 775,220

Claims priority, application Japan, Sep. 14, 1984, 59-193089

Int. Cl.[4] F01M 1/00

U.S. Cl. 123—196 R 4 Claims



1. An internal combustion engine comprising a valve actuating mechanism, a cylinder head having a recess formed around an ignition plug seat, said recess being defined by a peripheral wall, a cover covering said recess, means for injecting oil from an oil pan into said recess without passing through said valve actuating mechanism to thereby cool said cylinder head, oil passage means including a main discharge passage provided in said cylinder head with one end of said main discharging passage being in communication with said recess at a lower portion of said peripheral wall and with another end of said main discharging passage being led to a side face of said cylinder head, and pipe means with one end thereof being in communication with said main discharging passage other end and extending into oil accumulated in said oil pan whereby oil injected into said recess is returned below the surface of oil accumulated in said oil pan.

4,630,581

SYSTEM FOR CONTROLLING VAPORIZED FUEL IN AN INTERNAL COMBUSTION ENGINE

Norio Shibata, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 29, 1984, Ser. No. 666,251

Claims priority, application Japan, Jul. 31, 1984, 59-158733

Int. Cl.[4] F02M 25/08

U.S. Cl. 123—325 3 Claims

1. An internal combustion engine comprising

an engine body;

an intake system connected to the engine body;

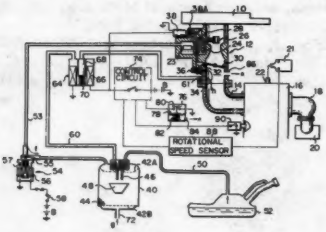
a throttle valve arranged in the intake system;

fuel passageway means opened to the intake system at a position downstream of the throttle valve in its idle position;

a canister provided therein with a layer for absorbing vaporized fuel, said canister having a purge air inlet on one side of the layer and a purge air outlet on the other side of the layer;

second passageway means for connecting the outlet of the

canister with the intake system at a position always downstream of the throttle valve;
purge control valve means for controlling the introduction of vaporized fuel from the canister to the engine;
fuel-cut valve means for controlling the introduction of fuel from the fuel passageway to the engine;
fuel-cut means responsive to a predetermined deceleration condition of the engine for operating the fuel-cut valve means so that the fuel passageway means are closed, including
first sensor means for detecting a predetermined degree of throttle opening corresponding to the idle condition of the engine,



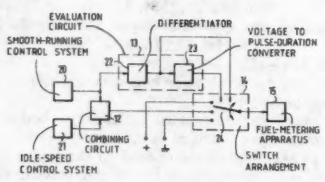
second sensor means for detecting an engine speed lower than a predetermined value, and
a first gate means responsive to signals from the first and the second sensor means for operating the fuel-cut valve
means to close the fuel passageway means when the throttle opening is smaller than the predetermined degree while the engine speed is higher than the first predetermined value; and
operating mens for closing the purge control valve means to prevent the introduction of vaporized fuel when the fuel is cut by the fuel-cut means and for opening the purge control valve means in accordance with the operating conditions, including at least engine speed, when the fuel is not cut.

4,630,582

ARRANGEMENT FOR RAPIDLY ADJUSTING AN ELECTROMAGNETIC LOAD ASSOCIATED WITH AN INTERNAL COMBUSTION ENGINE

Thomas Küttner; Max Straubel, both of Stuttgart, and Wolf Wessel, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 17, 1984, Ser. No. 661,808
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337908
Int. Cl.⁴ F02M *51/00, 3/00*; F02P *33/00*
U.S. Cl. 123—339 **13 Claims**



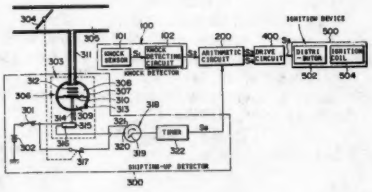
1. Arrangement for rapidly adjusting an electromagnetic load associated with an internal combustion engine or the like, the arrangement comprising:
first control means for generating a first signal for influencing said load;
second control means for generating a second signal for influencing said load;
combining circuit means for combining said first and said second signals to form one control signal for controlling said load;
said first control means having a priority status over said second control means;
evaluation means receiving and evaluating said first signal for generating an output influencing signal dependent thereon; and,
selection means for receiving both said control signal and said output influencing signal so as to permit said output influencing signal to influence said control signal applied to said load in dependence upon the evaluation performed in said evaluation means.

4,630,583

SPARK IGNITION TIMING CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH RETARDING MEANS RESPONSIVE TO TRANSMISSION GEAR SHIFTING

Mikio Suzuki, Zushi, and Masafumi Yamazaki, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Dec. 4, 1981, Ser. No. 327,570
Claims priority, application Japan, Dec. 4, 1980, 55-171325
The portion of the term of this patent subsequent to Sep. 23, 2001, has been disclaimed.
Int. Cl.⁴ F02P *5/14*
U.S. Cl. 123—425 **16 Claims**

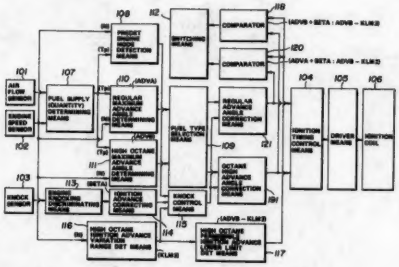


1. A spark ignition timing control system for an internal combustion engine of a vehicle having a transmission comprising:
an ignition device for causing spark ignition of the engine at a controlled timing;
a first sensor for detecting engine speed and producing a first sensor signal which has a value proportional to the detected engine speed;
a second sensor for detecting a knocking condition of the engine and producing a second sensor signal having a value proportional to the magnitude of engine knocking;
a third sensor for detecting the first sensor signal value indicative of the engine speed at which a shifting-up of a gear position of said transmission occurs and producing a third sensor signal when the transmission gear upshifting first sensor signal value is detected; and
control means for controlling a spark advance angle of said spark ignition based on the first sensor signal value and second sensor signal value, which control means is responsive to said third sensor signal to retard the spark advance angle.

4,630,584
FUEL OCTANE RESPONSIVE INTERNAL COMBUSTION ENGINE IGNITION SYSTEM

Kazuhiro Higashiyama, Ebina, and Kazuhiro Ishigami, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 28, 1985, Ser. No. 717,102
Claims priority, application Japan, Apr. 5, 1984, 59-68035
Int. Cl.⁴ F02P 5/145
U.S. Cl. 123—425 **9 Claims**



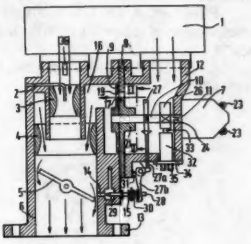
1. In an internal combustion engine having a combustion chamber
- a first sensor for sensing a parameter which varies with the presence of knocking phenomena in the combustion chamber of said engine;
- a second sensor for sensing the load on said engine;
- a third sensor responsive to the rotational speed of said engine;
- a spark generating arrangement for producing a spark in said combustion chamber; and
- a control circuit responsive to the outputs of said first, second and third sensors for controlling the timing at which said spark is generated, said control circuit including control means for:
- (a) causing said spark to be initially generated according to a first schedule suitable for fuel having a first octane value,
- (b) sensing said engine entering a predetermined mode of operation;
- (c) advancing the ignition timing until said first sensor detects said knocking phenomena;
- (d) comparing the conditions under which said knocking occurs with pre-recorded data,
- (e) determining the octane value of the fuel being combusted in said combustion chamber, and
- (f) causing said spark to be generated according to a second schedule suitable for fuel having a second octane value higher than said first octane value in the event that the octane value of the fuel being combusted in said combustion chamber is determined to be higher than that for which said first schedule is suited.

4,630,585
CARBURETING DEVICE FOR AN ENGINE

Jean Maraux, 43 Avenue Foch, 95170 Deuil la Barre, France

Filed Mar. 8, 1985, Ser. No. 709,734
Claims priority, application France, Mar. 9, 1984, 84 03652
Int. Cl.⁴ F02B 33/00
U.S. Cl. 123—438 **3 Claims**

1. A carburetor for supplying at least one chamber of an internal combustion engine with an air-fuel mixture, the carburetor comprising:
- a first conduit for carrying a fuel-rich mixture;
- a second conduit for delivering air to the fuel-rich mixture;
- adjustable constriction means located in the second conduit for setting the final fuel richness of the air-fuel mixture;
- servo means, responsive to engine speed, connected to an actuating motor;
- an adjustment member of the constriction means connected to the actuating motor for:
- sealing the constriction means near engine idling speeds;
- rapidly opening the constriction means at speeds slightly than idling;

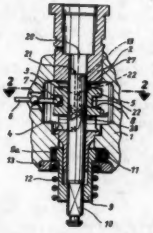


- continuing to open the constriction means at a slower rate after engine speed exceeds a predetermined level corresponding to an enrichment cut-out condition;
- wherein the servo means slightly delays movement of the adjustment member during engine speed increases so as to obtain fuel enrichment during engine acceleration.

4,630,586
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Josef Güntert, Gerlingen, and Walter Häfele, Feilbach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 6, 1985, Ser. No. 730,539
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1984, 3428174
Int. Cl.⁴ F02M 37/04
U.S. Cl. 123—500 **9 Claims**



1. A fuel injection pump for internal combustion engines comprising at least one rotatable pump piston having a jacket face provided with a longitudinal groove and defining a pump work chamber, a control slide on said piston, a radial diversion bore arranged to control an oblique groove on said pump piston jacket face, said control slide axially displaceable on said pump piston, said oblique groove further arranged to communicate with said pump work chamber via a conduit in said pump piston, the aforesaid longitudinal groove has an end arranged to communicate with an end of said oblique groove in proximity to said pump work chamber, and said longitudinal groove further including an end zone remote from said pump work chamber arranged to be uncovered by said control slide, at least at bottom dead center of said pump piston, whereby plunging of said pump piston into said control slide predetermines the supply onset of said injection pump.

4,630,587
FUEL INJECTION PUMP HAVING AN ADJUSTABLE INSTANT OF INJECTION

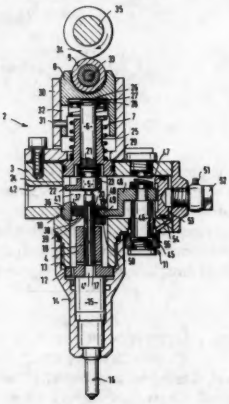
Gerald Höfer, Weissach-Flacht; Eberhard Hofmann, Kirchberg-/Murr; Helmut Laufer, Stuttgart, all of Fed. Rep. of Germany; Francois Rossignol, Mornant, France; Reinhard Schwartz; Max Straubel, both of Stuttgart, Fed. Rep. of Germany, and Raymond Tissot, Genas, France, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 4, 1982, Ser. No. 432,600

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1981, 3143073

Int. Cl.[4] F02M *39/00, 59/28*

U.S. Cl. 123—502 **8 Claims**



1. A housed fuel injection pump for Diesel engines having a pump cylinder, a pump piston in said cylinder, said pump piston having at least one control recess, said pump piston being reciprocated by a cam means and a spring means and being rotatable for adjusting an injection quantity, a control sleeve secured against rotation and arranged to cooperate with said control recess for varying the injection quantity, said pump including a hydraulic adjusting means for varying the instant of injection, said hydraulic adjusting means being disposed in a pressure chamber, said pressure chamber comprises an adjusting cylinder which is disposed parallel to said pump cylinder and said hydraulic adjusting means further includes an adjusting piston, said adjusting piston and said adjusting cylinder are accommodated inside said housing of said injection pump, and further said control sleeve and said adjusting piston encircle said pump piston and comprise a one-piece structural component and are adjustable longitudinally of said pump piston.

4,630,588
FUEL INJECTION TIMING CONTROL SYSTEM

Ryuichi Sagawa; Osamu Nagata, both of Kobe, and Takashi Kajima, Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 22, 1983, Ser. No. 554,274

Claims priority, application Japan, Nov. 25, 1982, 57-207292; Nov. 25, 1982, 57-207293

Int. Cl.[4] F02M *31/00*

U.S. Cl. 123—506 **2 Claims**

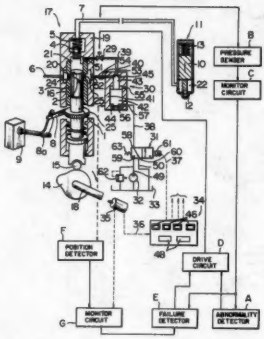
1. A fuel injection timing control system of an internal combustion engine comprising:

a fuel injection pump of a constant stroke type driven in synchronism with the operation of the internal combustion engine;

a fuel valve operative to automatically effect fuel injection by the pressure under which a fuel is discharged from said fuel injection pump, said fuel valve being connected to said fuel injection pump through a fuel injection pipe;

fuel return means including a return passage and a control valve in said return passage for controlling the return of fuel discharged from the fuel injection pump to a fuel source supplying the fuel to the fuel injection pump;

means for controlling the timing of operation of said control valve to vary the initiation of pressure output from the fuel injection pump and thereby the timing of fuel injection including an angle detector for detecting the crank angular position of the internal combustion engine, a setter



for setting a desired advance angle therein, and a comparator for comparing the crank angular position detected by said angle detector with the desired advance angle set in said setter and generating a signal responsive to the output from said comparator for actuating said control valve;

an independent solenoid-operated cut-off valve mounted in said return passage;

a means for sensing an abnormality in fuel injection timing and producing a signal representative thereof; and

a drive means for closing said cut-off valve to prevent return fuel flow through said return passage responsive to the signal from said abnormality sensing means.

4,630,589
EXHAUST GAS RECIRCULATION METHOD FOR INTERNAL COMBUSTION ENGINES

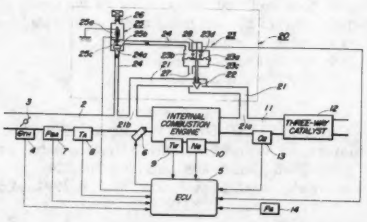
Makoto Hashiguchi, Kawagoe, and Yohji Fukutomi, Sayama, both of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Sep. 9, 1985, Ser. No. 773,818

Claims priority, application Japan, Sep. 11, 1984, 59-188948

Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—571 **4 Claims**



1. A method of controlling exhaust gas recirculation in an internal combustion engine having an exhaust passage, an intake passage, and a throttle valve arranged in said intake passage, by means of an exhaust gas recirculation control system including an exhaust recirculating passage connected between said exhaust passage and said intake passage, an exhaust gas recirculating valve arranged across said exhaust gas recirculating passage, and differential pressure-operated actua-

tor means for varying the opening of said exhaust gas recirculating valve, said differential pressure-operated actuator means having a pressure-responsive member having one side surface acted upon by atmospheric pressure, and another side surface by a synthetic pressure of pressure within said intake passage at a zone downsteam of said throttle valve and atmospheric pressure wherein said pressure-responsive member is displaceable in response to a pressure difference between the atmospheric pressure applied to said one side surface thereof and said synthetic pressure of said intake passage pressure and atmospheric pressure, applied to said another side surface thereof, said differential pressure-operated actuator means being adapted to vary said synthetic pressure in response to at least one operating parameter of said engine to control said exhaust gas recirculating valve, the method comprising the steps of: (1) detecting the atmospheric pressure and the pressure within said intake passage at said zone downstream of said throttle valve; (2) determining a difference between the detected value of atmospheric pressure and the detected value of the pressure within said intake passage; and (3) controlling said exhaust gas recirculating valve to a fully closed position when the determined pressure difference is smaller than a predetermined value.

4,630,590

INTERNAL COMBUSTION ENGINE APPARATUS

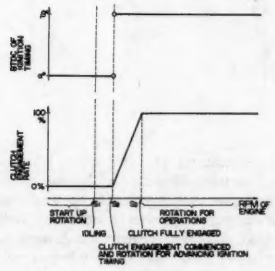
Tadashige Kondo, Nerima, and Hisashi Inaga, Suginami, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Jun. 14, 1985, Ser. No. 744,694

Claims priority, application Japan, Jun. 27, 1984, 59-95182[U]

Int. Cl.⁴ F02P 5/04

U.S. Cl. 123—602 **2 Claims**



1. An internal combustion engine apparatus comprising, in combination,

an internal combustion engine having an ignition system capable of step advance when a predetermined engine speed is reached between low and high ranges of engine speed; and

a centrifugal clutch connected to an output shaft of said internal combustion engine, said centrifugal clutch being engaged and disengaged at substantially said predetermined engine speed.

4,630,591

STRATIFIED CHARGE INTERNAL COMBUSTION ENGINES

Bernard Hooper, Stourbridge, England, assignor to National Research Development Corporation, London, England

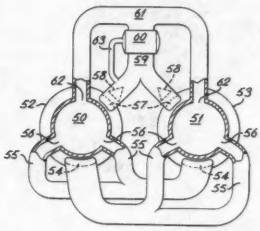
Continuation of Ser. No. 467,166, Feb. 16, 1983, abandoned.

This application Feb. 20, 1986, Ser. No. 831,069

Claims priority, application United Kingdom, Feb. 17, 1982, 8204716

Int. Cl.⁴ F02B 75/02

U.S. Cl. 123—65 S **7 Claims**



1. A stratified-charge, stepped piston, two-stroke internal combustion engine comprising:

at least first and second stepped cylinders;

a first stepped piston movable within said first stepped cylinder and defining therewith first and second working spaces of variable volume, said first working space constituting a volume in which a firing force is generated by which said first piston is driven, and said second working space being adapted to contribute to a pumping action;

a second stepped piston movable within said second cylinder and defining therewith third and fourth working spaces of variable volume, said third working space constituting a volume in which a firing force is generated to drive said second piston and said fourth working space being adapted to contribute to a pumping action;

a first connection between said second working space and said third working space and a second connection between said fourth working space and said first working space, said first and second connections being without intercommunication and serving main transfer passages wherein combustion air necessary for the generation of the firing forces operable upon said second and first pistons is generated;

a third connection between said second working space and said third working space and a fourth connection between said fourth working space and said first working space;

said third and fourth connections being interconnected at a meeting point, a first non-return valve positioned in said fourth connection between said fourth working space and said meeting point, wherein said third and fourth connections are adapted to act as a common auxiliary transfer passage system such that further combustion air may pass from said second to said third working space and from said fourth to said first working space;

fuel supply means for supplying fuel to be mixed with said further combustion air flowing to said first and said third working spaces, and located within said auxiliary transfer passage system in proximity to said meeting point; and

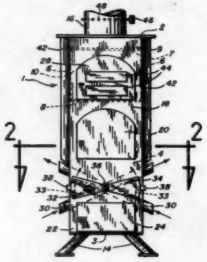
regulator means being provided within said fuel supply means and associated with the flow of said further combustion air within said auxiliary transfer passage system in proximity to said meeting point, for regulating the rate of said supply of fuel so that said rate of fuel supply bears a predetermined relationship to said air flow within said auxiliary transfer passage system.

4,630,592

WOOD STOVE

Ludger Larabie, R.R. 2, Kapuskasing, Ontario, Canada P5N 2X8

Filed Jun. 24, 1985, Ser. No. 748,220
Int. Cl.[4] F24C *1/14*
U.S. Cl. 126—4 4 Claims



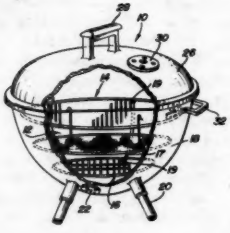
1. A stove comprising an enclosure having a front wall, a rear wall, top and bottom walls, and two side walls, a smoke outlet made in said top wall, an upper and a lower partition fixedly mounted to said walls in vertically-shaped relationship within said enclosure, intermediate and parallel to said top and bottom walls, a smoke space, and a cooking oven space being defined above said upper partition and between said upper and lower partitions, respectively, a grate extending within said enclosure intermediate said lower partition and said bottom wall, a combustion chamber and an ash-pit being defined above and below said grate, respectively, an air intake for said combustion chamber, said grate comprising a plurality of hollow cylindrical metallic ducts, which criss cross in order to form an X and which open outwardly at each end, the ends of each duct extending through and fixed to said side walls permitting the ambient air to circulate through said ducts; each of said ducts having an intermediate crossing portion that is substantially flattened, said grate being able to support a solid combustible, yet allowing therethrough by gravity the cinders into said ash-pit; a plurality of lateral semi-cylindrical upright pipes closed at both ends and fixedly secured to and projecting from the exterior face of each of said side walls between said top wall and the outer ends of said ducts, said side walls having first and second openings making communication between said combustion chamber and said pipes and between the latter and said smoke space, respectively.

4,630,593

BARBECUE GRILL WITH FIRE RETARDING SCREEN

Ernest J. Gremillion, P.O. Box 556, Larose, La. 70373

Filed Sep. 27, 1985, Ser. No. 780,986
Int. Cl.[4] A47J *37/07*; F24B *13/02*
U.S. Cl. 126—25 R 4 Claims



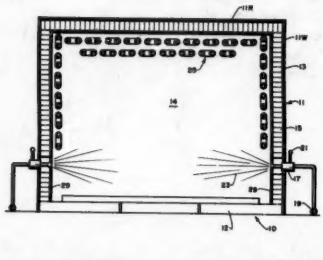
1. In combination with a barbecue grill which includes a food product cooking grill supported in generally a horizontal plane for supporting food articles to be cooked thereon and a fuel burning assembly located below the cooking grill for cooking the food products on the grill, the improvement comprising a fire retarding screen, and means supporting the fire retarding screen in spaced parallel relation below the cooking grill and above the fuel burning assembly to retard flare up of flame from grease or fat drippings dropping onto and accumulating in the fuel burning assembly and subject to flame flare-up when supplied with oxygen resulting in charring of the food products and danger to the user of the grill, said fire retarding screen including metal wire members woven into a mesh with small passageways to retard flame passing upwardly therethrough with the passageways being of a size to retard any flame passing therethrough, said fuel burning assembly producing high heat intensity in the retarding screen for immediately dissipating grease and/or fat drippings dripping thereon, said means supporting the fire retarding screen including a plurality of hook-shaped clips, means movably connecting the hook-shaped clips to the fire retarding screen to enable the clips to move to a position against the fire retarding screen to be packaged, stored and transported in a compact condition, said clips including hooks on the free ends thereof for detachable hooking engagement with the food grill to support the fire retarding screen suspended below the grill with the fire retarding screen and clips being removable with the cooking grill to enable access to the fuel burning assembly without separation of the fire retarding screen from the cooking grill.

4,630,594

FURNACE WALL LINING COMPOSITION AND THE USE THEREOF

Russell R. Ellersick, 600 Commerce Dr., Suite A, Roseville, Calif. 95678

Continuation-in-part of Ser. No. 473,759, Mar. 9, 1983, abandoned. This application Feb. 6, 1985, Ser. No. 698,613
Int. Cl.[4] F24C *15/08*
U.S. Cl. 126—64 7 Claims



1. An improved natural gas or heating oil fired furnace which furnace has tubes therein for the formation of super heated steam or for the carrying out of chemical reactions, and which furnace further comprises a chamber lined with an insulative material, the improvement comprising: a combination of said insulative material, and an infrared ray reflecting composition thereupon, said reflecting composition adapted to impede penetration of infrared rays through said insulative material, said composition comprising:

1 to 50% of an aqueous slurry having an acidic pH of a chromate-phosphate binder and dispersed aluminum particles,

50 to 90% of a coating cement comprised of

about 38% of Al_2O_3

about 58% SiO_2

about 0.7% Na_2O

about 0.3% MgO

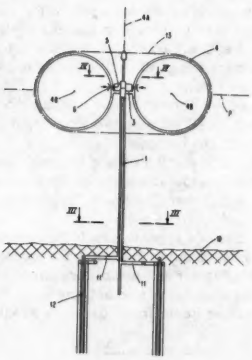
about 0.7% Fe_2O_3

about 1.5% TiO_2
an trace organics about 0.6%
1 to 5% of a suspended amorphous silica hardener the total being 100%.

4,630,595
ENERGY COLLECTOR FOR HEAT PUMP INSTALLATIONS

Erhard Ledwon, Tannenweg 29, D-6340 Dillenburg 3, and Willibald Lang, Lorenz-Oechsler-Weg 13, D-7590 Achern 2, both of Fed. Rep. of Germany

Filed May 23, 1985, Ser. No. 737,269
Int. Cl.[4] F24J *2/00*
U.S. Cl. 126—417 **8 Claims**



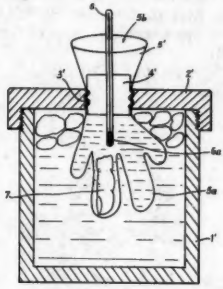
1. Energy collector for an outdoor heat pump installation, comprising an upright stand and an air-heat exchanger body through which a heat transport medium is to be conducted, said body mounted on said stand and comprising helical tubular coil means for conducting the heat transport medium, said coil means extending helically about a helix axis, said helix axis being endless about a main axis such that said coil means forms a toroid and said endless helix axis defines a plane disposed perpendicularly to said main axis.

4,630,596
EMERGENCY CONTAINER FOR AN ACCIDENTALLY AMPUTATED MEMBER

Patrick Hales, 25 Allée de la Fontaine au Blanc, 78860 St Nom La Breteche; Jean-Pierre Laurier, Le Moulin de la Bonde, 78121 Crespieres, and Gerard Pradet, 5 rue des Gate-Ceps, 92210 Saint-Cloud, all of France

Filed Feb. 21, 1985, Ser. No. 703,841
Claims priority, application France, Feb. 24, 1984, 84 02822; Nov. 13, 1984, 84 17309
Int. Cl.[4] A61F *7/10, 17/00*
U.S. Cl. 128—1 R **12 Claims**

1. A portable emergency container for conserving an accidentally amputated member, the container comprising: a rigid, open topped receptacle having thermally insulating walls and a thermally insulating base, said receptacle being adapted to hold iced water, a thermally insulating cover for closing the open top of the receptacle, said cover defining a through opening, a bag of flexible material adapted to carry an amputated member and be immersed in iced water inside the receptacle with an opening of the bag coinciding with the opening of the cover, and a stopper for simultaneously closing the openings in both the cover and the bag to thereby maintain an amputated

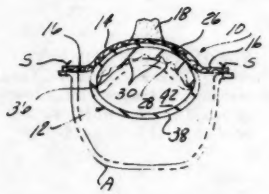


member at a near freezing temperature to implement the prolonged conservation of said member.

4,630,597
DYNAMIC AORTIC PATCH FOR THORACIC OR ABDOMINAL IMPLANTATION

Adrian Kantrowitz, 70 Gallogly Rd., Pontiac, Mich. 48055, and Paul S. Freed, 1486 Sodon Ct., Bloomfield, Mich. 48013

Filed Apr. 30, 1984, Ser. No. 604,944
Int. Cl.[4] A61F *1/24;* A61M *1/03*
U.S. Cl. 128—1 D **3 Claims**



1. In a dynamic aortic patch or the like adapted to be positioned in a aorta including a flexible bladder means in contact with blood passing through the aorta, the bladder means adapted to be cyclically inflated and deflated and conduit means for conducting fluid to and from the interior of said bladder to inflate and deflate said bladder means; the improvement wherein said bladder means comprises an elongate semi-rigid shell member having an outer surface and a concave inner surface terminating at a smoothly rounded, continuously curved peripheral side edge located between the concave inner surface and the outer surface, and a flexible, air-tight membrane bonded to said shell member continuously along the outer surface of the shell membrane immediately adjacent to the entire peripheral side edge and defining an enclosed internal chamber between said membrane and said concave inner surface of said shell membrane, said membrane having a surface area substantially equal to the surface area of said inner surface whereby said membrane lies in substantially smooth, face-to-face contact with said inner surface when said bladder means is deflated, passage means extending through said shell member for placing said internal chamber in fluid communication with said conduit means.

4,630,598

URETERO-RENOSCOPE

Ludwig Bonnet, Knittlingen, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Fed. Rep. of Germany

Filed May 16, 1985, Ser. No. 734,678

Claims priority, application Fed. Rep. of Germany, May 29, 1984, 8416392[U]

Int. Cl.[4] A61B *1/30*

U.S. Cl. 128—7 9 Claims

1. In an uretero-renoscope comprising a hollow main shaft with axial passage means therethrough for receiving both an optical system with an outer surface and an auxiliary instrument with an outer surface and for the passage of a scavenging fluid, an improvement comprising said axial passage means being formed by a single inner shaft being received within said hollow main shaft, said inner shaft having an axial passage therethrough and having a smaller cross-sectional area than the inner cross-section of said hollow main shaft to divide said inner cross-section into two separate passages with inner surfaces to separately accommodate said optical system and said auxiliary instrument respectively, each of said two separate passages with the respective optical system and auxiliary instrument in position a providing free space between the inner surface of each passage and an outer surface for the passing of scavenging fluid so that the inflow and outflow of said scavenging fluid can proceed simultaneously.

4,630,599

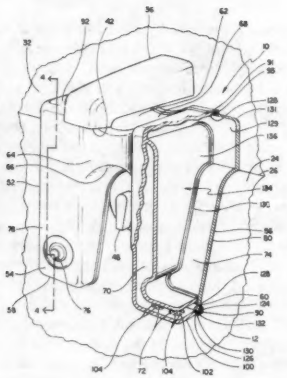
HYDROMASSAGE APPARATUS

Matthew J. Perovick, Cleve, and James W. Lang, Lakewood, both of Ohio, assignors to Unidyne, Inc., Cleveland, Ohio

Filed Jan. 31, 1986, Ser. No. 824,540

Int. Cl.[4] A61H *9/00*; A47K *3/10*

U.S. Cl. 128—66 14 Claims



1. A hydromassage apparatus for producing whirlpool action in a conventional bathtub having a water inlet conduit and drain valve control in association with one wall of the bathtub, said hydromassage assembly adapted to be partially immersed in the bathtub filled with a supply of liquid, said hydromassage assembly comprising;

a housing having a pair of leg portions positionable adjacent opposing sides of the drain valve control and downward the one side of the bathtub, said leg portions having lower portions thereof adapted to be immersed in the bathtub when filled with a supply of liquid;

said housing having an intermediate portion interconnecting said leg portions;

said housing having an inlet chamber, said inlet chamber having at least one inlet opening in each of said lower immersed portions for receiving liquid contained in the bathtub into said inlet chamber, said inlet chamber extending between said inlet openings of said lower immersed portions of said leg portions;

said housing having an outlet chamber, said outlet chamber having at least one opening in each of said lower immersed portions of said leg portions for allowing pressurized liquid to flow therefrom and provide a hydromassage whirlpool action, said outlet chamber extending between said outlet openings of said lower immersed portions of said leg portions;

said intermediate portion of said housing having a front face contoured to allow water to flow from the water inlet conduit into the bathtub;

said intermediate portion of said housing having a side face contoured to allow mounting of the housing adjacent the drain valve control without impeding the operation thereof; and

said hydromassage apparatus including means for connecting said inlet chamber to a pump for receiving liquid from said inlet chamber and means for connecting the pump to said outlet chamber of said housing for providing the flow of pressurized liquid from the pump to said outlet chamber.

4,630,600

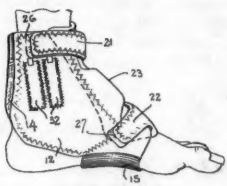
ANKLE BRACE AND PROTECTOR

Treesa Spencer, and Terry Alberta, both of Santa Ana, Calif., assignors to Pro-Tec Sports, Inc., Santa Ana, Calif.

Filed Feb. 18, 1986, Ser. No. 830,325

Int. Cl.[4] A61F *3/00*

U.S. Cl. 128—80 R 7 Claims



1. A device for protecting and bracing the ankle and adjacent portions of a user's foot comprising

a pair of similar opposing side pads adapted to fit against said ankle portion, said side pads having rear and bottom edges,

first elastic strap means for joining together the rear edges of said side pads,

second elastic strap means for joining together the front portions of the bottom edges of said side pads, there being a space between the first and second elastic strap means for receiving the user's heel,

flap portions extending laterally from each of said side pads, each of said flap portions having cinch strap means extending therefrom for cinching the side pads against the user's ankle, and

front pad member means attached to one of said side pads for covering and protecting the user's instep.

4,630,601

BONE NAIL FOR THE TREATMENT OF FRACTURES

Hans E. Harder, Probstelerhagen, and Hermann Kramer, Neumunster, both of Fed. Rep. of Germany, assignors to Howmedica International, Inc., Kiel, Fed. Rep. of Germany

Filed May 12, 1983, Ser. No. 493,887

Claims priority, application Fed. Rep. of Germany, May 18, 1982, 8214493[U]; European Pat. Off., Mar. 18, 1983, 83102694.3

Int. Cl.[4] A61F 5/04

U.S. Cl. 128—92 YZ 11 Claims

1. A thin, flexible and resilient bone nail for the treatment of fractures in the proximal femur zone, comprising a distal end portion adapted to be disposed at the outer surface of the femoral condyle, said distal end portion including a coupling portion for engagement with a driving tool, a proximal end portion adapted to be seated in the natural femoral head and having a free end, and a curved intermediate portion between said end portions, with said proximal end portion being provided at the free end thereof with a rounded-off thickened portion having a flattened proximal surface angulated at such a non-perpendicular angle with respect to the segment of said proximal end portion immediately adjoining said rounded-off thickened portion that said surface lies approximately normal to the direction of physiological loading of the natural femoral head when said proximal end portion is seated therein in use.

4,630,602

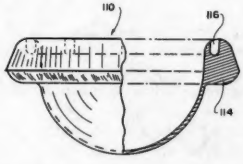
DISPOSABLE CONTRACEPTIVE CERVICAL BARRIER

Melvyn B. Strickman, R.D. 1, Lawrence Rd., Bridgeton, N.J. 08302, and Erick-Pierre Fournier, 30 Park Ave., New York, N.Y. 10016

Filed Mar. 29, 1984, Ser. No. 594,933

Int. Cl.[4] A61F 5/46

U.S. Cl. 128—127 7 Claims



1. A disposable contraceptive cervical barrier comprising:

a substantially bowl-shaped thin flexible member;

a substantially circular rim portion unitary with said flexible member adjacent the upper portion thereof, said rim portion being substantially thicker than said flexible member and defining a means for achieving a spring tension effect;

said rim portion extending only outwardly from said flexible member such that the inner surface of said bowl-shaped member adjacent the upper portion thereof is substantially smooth, and

a plurality of cavities formed in said rim portion, said cavities being open so as to be capable of receiving and holding a quantity of a spermicide.

4,630,603

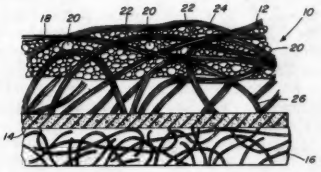
WOUND DRESSING

John M. Greenway, Westwood, Mass., assignor to The Kendall Company, Boston, Mass.

Filed Feb. 13, 1986, Ser. No. 829,587

Int. Cl.[4] A61L 15/00

U.S. Cl. 128—156 5 Claims



1. A wound dressing comprising at least one ply of an aerated latex microsized porous bacterial barrier fabric, having an adhesive disposed on at least one surface of said fabric, and a nonwoven pad material disposed on said adhesive and secured thereby.

4,630,604

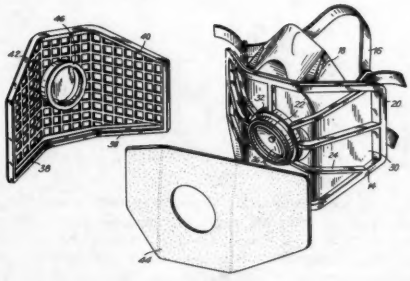
VALVE ASSEMBLY FOR A REPLACEABLE FILTER RESPIRATOR

Edward N. Montesi, Barrington, R.I., assignor to Siebe North, Inc., Charleston, S.C.

Filed Apr. 9, 1985, Ser. No. 721,284

Int. Cl.[4] A62B 7/00

U.S. Cl. 128—206.15 1 Claim



1. In a half mask of the type including:

a face piece,

a valve assembly rigidly affixed to said face piece and providing an exhalation valve having an inlet and an outlet defining a cylindrical valve seat for an exhalation valve, and, an inhalation valve having an inlet and an outlet defining an annular valve seat for an inhalation valve arranged concentrically with and radially outwardly of said exhalation valve;

valve members cooperating with said respective valve seats; and,

filter element means in communication with said annular valve seat: the improvement comprising:

said face piece being formed from a resilient and compliant material;

a substantially rigid imperforate wall member integral with and completely surrounding said annular valve seat and extending radially outwardly thereof;

said imperforate wall member terminating at its outer periphery in a continuous peripheral flange extending forwardly of said wall member and then outwardly thereof to define a shallow recess at the front of said wall member;

ribs on said wall member extending forwardly thereof and in directions generally radially of said valve assembly, said ribs defining channels on the front face of said wall member which communicate with said inlet of said annular inhalation valve seat;

a layer of filter material co-extensive with said imperforate wall member and overlying said ribs;

a perforate frame member co-extensive with said wall member and overlying said filter material, said frame member having a central opening and a cylindrical extension surrounding said opening for spigotal cooperation with said cylindrical valve seat of said exhalation valve;

latch means integral with said frame member and for latching cooperation with the outwardly extending portion of said wall flange; and,

harness attachment means on a rearmost face of said wall for attaching said half mask to the head of a user;

said wall, said filter element and said frame extending laterally toward both sides of said face piece in dihedral formation and presenting a maximized filtering surface area of said filter.

4,630,605

RESPIRATOR CONTROL DEVICE

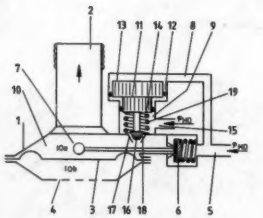
Adalbert Pasternack, Bad Schwartau, Fed. Rep. of Germany, assignor to Drägerwerk AG, Fed. Rep. of Germany

Filed Jun. 3, 1985, Ser. No. 740,560

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422023

Int. Cl.⁴ A62B 9/02

U.S. Cl. 128—205.24 **3 Claims**



1. A device for use with a respirator having a breathing gas supply and a pressure gas supply, comprising a housing having a hollow space, a diaphragm extending across the hollow space dividing the space into an ambient side communicating with the atmosphere and a high pressure side having a nipple connection for the supply of a patient, a medium pressure supply line connected to the breathing gas supply and to the high pressure side of said housing hollow space, a swivel valve in said medium pressure supply line having an actuator extending into the high pressure side and positioned to be moved by said diaphragm during pressure changes in said housing hollow space to open and close said valve, a high pressure connection to said housing high pressure side and to said pressure gas supply, a high pressure piston valve in said high pressure connection including a valve cylinder having a small diameter portion connected to said high pressure connection and a larger diameter portion having a larger diameter than said small diameter portion connected to said medium pressure supply line upstream of said swivel valve, a valve member for opening and closing said piston valve having a large diameter piston portion in said large diameter cylinder portion with a top end area exposed to connection pressure of said pressure gas supply connection and a small diameter portion having a bottom end area exposed to said high pressure connection, spring biasing said piston valve to an open position and acting with said large diameter piston portion and said small diameter piston portion to regulate flow into the high pressure side of said housing, said swivel valve providing normal access for the respiratory gas in the medium pressure to the high pressure side of said machine housing and said high pressure connection of said piston valve to said supply connection permitting direction high pressure gas flow into the high pressure side of said housing through said piston valve, which valve opens upon failure of the medium pressure supply.

4,630,606

DEVICE FOR DETERMINING AND EVALUATING THE PRESSURE IN A BALLOON SLEEVE OF A CLOSED TRACHEAL TUBE

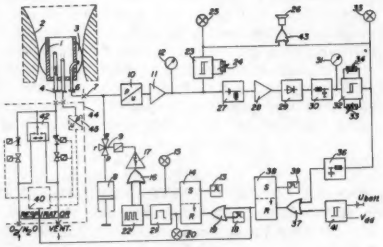
Hilko Weerda, Bad Krozingen, and Peter Pedersen, Freiburg, both of Fed. Rep. of Germany, assignors to Drägerwerk AG, Fed. Rep. of Germany

Filed Jul. 20, 1984, Ser. No. 633,100

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327342

Int. Cl.⁴ A61M 16/00

U.S. Cl. 128—207.14 **17 Claims**



1. A device for determining and acting upon the pressure in a balloon sleeve of a closed tracheal tube, with inflation means connected to the sleeve for inflating and deflating the sleeve, comprising:

a tracheal tube;

a balloon sleeve surrounding said tube;

inflation means, connected to said sleeve, for inflating said sleeve;

deflation means connected to the inflation means for deflating the sleeve;

a cannula connected to the sleeve and to the inflation means for inflating the sleeve;

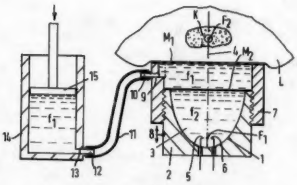
a pressure-to-voltage converter connected to said cannula for generating a first voltage signal corresponding to an instantaneous static pressure in the sleeve; and

voltage signal processing means connected between said converter and said deflating means for producing a deflation signal when a frequency of variations of pressure in the sleeve is out of a selected range of frequencies for a selected period of time, said deflation signal being applied to said deflation means for deflating the sleeve.

4,630,607
APPARATUS FOR THE NON-CONTACT DISINTEGRATION OF STONY OBJECTS PRESENT IN A BODY BY MEANS OF SOUND SHOCKWAVES

Simon Duinker, Bloemendaal, and Hendrik Mulder, Delft, both of Netherlands, assignors to N.V. Optische Industrie "De Oude Delft", Netherlands

Filed Jul. 18, 1984, Ser. No. 632,209
Claims priority, application European Pat. Off., Jul. 19, 1983, 83201075.5
Int. Cl.[4] A61B *17/22*
U.S. Cl. 128—328 14 Claims



1. An apparatus for the non-contact disintegration of a concrement present in a body by means of sound shockwaves, which comprises:

a reflector block having a reflector chamber defining a reflective axis, said reflector chamber being filled with a liquid, said reflector chamber having a surface rotary symmetry in a semi-elliptical cross-sectional configuration defining a first focus for generating sound shockwaves and a second focus for focusing reflected sound waves generated at said first focus;

means for generating said shockwaves at said first focus;

a rigid coupling member disposed on said reflector block for contacting said body, said coupling member being filled with a liquid;

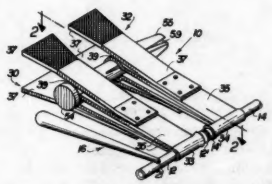
means for axially adjusting said coupling member with respect to said reflector block; and

means for angularly adjusting said coupling member with respect to said reflector block, said adjusting means permitting alignment of said second focus to coincide with said concrement present in said body.

4,630,608
SURGICAL INSTRUMENTATION INCLUDING A CLAMP ASSEMBLY TO FACILITATE ATTACHMENT OF BLOOD VESSEL SECTIONS

Juan Arroyo, 12200 SW. 93 St., Miami, Fla. 33186

Filed Jun. 12, 1985, Ser. No. 743,940
Int. Cl.[4] A61B *17/08, 17/00*
U.S. Cl. 128—335 21 Claims



1. A surgical instrumentation assembly of the type primarily designed for the attachment of blood vessel sections about correspondingly positioned open ends thereof and in aligned relation to one another, said assembly comprising:

(a) support means for aligned positioning of the vessel sections relative to one another and structured for interior, supporting engagement of both vessel sections,

(b) said support means including an elongated portion dimensioned for exterior, supporting engagement with both vessel sections and being disposable in coaxial relation concurrently within both vessel sections,

(c) positioning means structured for exterior engagement with said vessel sections and aligned positioning and maintenance of the open ends into attachable position relative to one another,

(d) said positioning means comprising a sleeve element for each vessel section, each sleeve element positionable into at least partially surrounding and engaging relation with the respective vessel section,

(e) each sleeve element comprising a proximal end disposable adjacent the open end of the respective vessel sections, each of said proximal ends dimensioned and structured for engagement and maintenance of the respective open end into said attachable position,

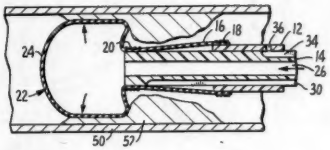
(f) securement means for positioning said sleeve elements relative to one another and structured for interconnecting said sleeve elements to one another for maintenance thereof into engageable relation with said respective vessel sections, and

(g) said support means and said sleeve elements relatively structured and dimensioned to maintain the respective vessel sections in sandwiched relation therebetween and the open ends of the vessel sections in said attachable position.

4,630,609
DILATATION CATHETER METHOD AND APPARATUS

Albert K. Chin, San Francisco, Calif., assignor to Thomas J. Fogarty, Palo Alto, Calif.

Filed May 14, 1981, Ser. No. 263,776
Int. Cl.[4] A61M *29/02*
U.S. Cl. 128—344 5 Claims



3. A dilatation catheter for occluded blood vessels comprising a tubular carrier, a first balloon having proximal and distal end portions attached to said carrier at the distal end portion thereof, a second balloon having a proximal end portion attached to said carrier at the distal end thereof adjacent the distal end portion of said first balloon and having a free end inverted within said carrier, and means to selectively pressurize and depressurize said balloons, said first balloon being radially expansible and contractible in response to pressurization and depressurization, said second balloon being evertable from said carrier and longitudinally expansible without substantial lateral expansion under pressurization and thereafter laterally expansible under increased pressurization.

4,630,610
SURGICAL VEST

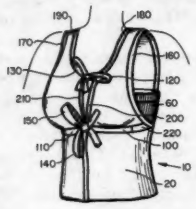
Jo Ann Fletcher, 220 Carroll Dr., St. Clairsville, Ohio 43950

Filed Jul. 26, 1985, Ser. No. 759,251
Int. Cl.[4] A41C *3/00*
U.S. Cl. 128—501 10 Claims

1. An article of apparel, comprising:

a thoracic sheath having at least one external strap means thereon which extends, when in position on a wearer, generally from the area of the sternum to a point generally under the arm, and which is attached at each of its ends to

said thoracic sheath both in the area of the sternum and at a point generally under the arm, whereby said external



strap means positions below and supports the natural or prosthetic breast of the wearer.

4,630,611

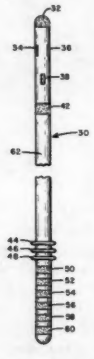
ORTHOGONALLY-SENSING LEAD

Wendell L. King, North Oaks, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 2, 1981, Ser. No. 230,572

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—642 **4 Claims**



1. A body implantable lead comprising:

first, second, third, fourth, fifth, and sixth electrodes mutually insulated from one another and arranged as three electrode pairs;

an elongated lead body means for disposing said first, second, third, fourth, fifth, and sixth electrodes in substantially fixed relationship to one another, arranged such that said three electrode pairs define three mutually orthogonal sensing vectors;

first, second, third, fourth, fifth, and sixth connector means for simultaneously coupling said first, second, third, fourth, fifth, and sixth electrodes to a monitoring device; and

first, second, third, fourth, fifth, and sixth mutually insulated conductors extending along said lead body means each having a proximal end respectively coupled to said first, second, third, fourth, fifth, and sixth connector means and a distal end respectively coupled to said first, second, third, fourth, fifth, and sixth electrodes.

4,630,612

ULTRASONIC DIAGNOSTIC APPARATUS

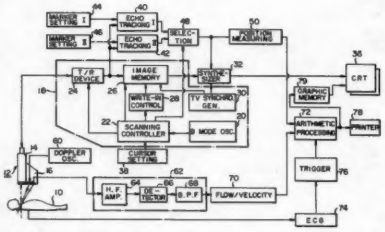
Rokuroh Uchida; Katsuhiko Nagasaki; Yasunori Miyake, all of Tokyo; Michio Ohno, Kawasaki; Hitoshi Takeichi, Kawasaki, and Hiroji Matsumoto, Kawasaki, all of Japan, assignors to Aloka Co., Ltd., Tokyo and Hayashi Electric Co., Ltd., Kanagawa, both of, Japan

Filed May 25, 1984, Ser. No. 614,432

Claims priority, application Japan, May 25, 1983, 58-90765; May 25, 1983, 58-90766; May 25, 1983, 58-77587[U]

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—660 **11 Claims**



1. An ultrasonic diagnostic apparatus comprising an ultrasonic probe which transmits and receives an ultrasonic wave signal to and from a portion under examination which includes a moving member, a transmission and reception circuit coupled to said ultrasonic probe for controlling the pulse transmission and reception operation of the ultrasonic probe, a B-mode display for displaying a B-mode tomographic image in accordance with an ultrasonic B-mode image signal received from the transmission and reception control circuit, a cursor setting device for supplying to the transmission and reception control circuit a cursor position signal in order to display a cursor at a desired scan position of the B-mode display, at least one echo tracking circuit coupled to said B-mode display for causing at least one marker to track the video signal of the moving member at a desired position on the cursor in response to the receipt of an initial marker signal, at least one marker setting device for supplying to the echo tracking device said initial marker signal for setting the initial position of the marker on the cursor, a synthesizer coupled to said transmission and reception control circuit and said echo tracking circuit for synthesizing and sending to the B-mode display the B-mode image signal from the transmission and reception control circuit and the marker image signal from the echo tracking circuit, and a position measuring circuit coupled to said echo tracking circuit for measuring the position of the moving member on the cursor in accordance with the marker image signal from the echo tracking circuit.

4,630,613

PULSE DETECTION

Christopher J. Dennis, Harrogate, England, assignor to Equipaid Limited, West Yorkshire, England

Filed Jun. 27, 1983, Ser. No. 508,278

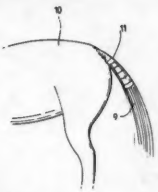
Claims priority, application United Kingdom, Jun. 26, 1982, 8218563

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—687 **3 Claims**

1. A method for monitoring the pulse rate of an animal having a tail with a root attached to the body of the animal, the methd comprising: detecting the pulse at the root of the tail of said animal, producing a pulse signal corresponding to said pulse of said animal, transmitting said pulse signal to a remote signal analyzer which includes a pulse indicator means which

is responsive to analyzed signals, and exhibiting on the indica-



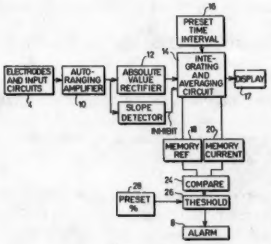
tor means at least one characteristic of the pulse of the animal.

4,630,614

APNEA MONITORING APPARATUS

Dan Atlas, Mashabim 20, Hod Hasharon, Israel

Filed Mar. 5, 1985, Ser. No. 708,416
Claims priority, application Israel, Apr. 8, 1984, 71468
Int. Cl.⁴ A61B *5/08*
U.S. Cl. 128—721 **8 Claims**



1. Apparatus for monitoring a subject to detect the occurrence of apnea, comprising:

a plurality of electrodes to be applied to spaced points on the subject for detecting the respiration rate and respiration amplitude of the subject by the change in electrical impedance between said spaced points;

computing means including an averaging circuit averaging the detected respiration rate and respiration amplitude over a predetermined time interval covering a plurality of breaths of the subject and computing therefrom the average respiration volume of the subject;

storage means for storing, as a reference average volume, the average respiration volume of the subject during an initial time interval, and also for storing, as current average volumes, the average respiration volume of the subject during subsequent time intervals;

comparing means for comparing each of said current average respiration volumes with said reference average respiration volume; and

signalling means actuated to indicate the occurrence of apnea whenever a current average respiration volume falls below said reference average respiration volume by a predetermined percentage.

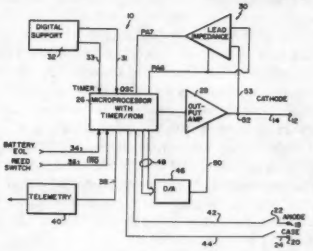
4,630,615

APPARATUS FOR MEASURING IMPEDANCE

Barry M. Yomtov, Cooper City, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed May 21, 1984, Ser. No. 612,553
Int. Cl.⁴ H61B *5/00*
U.S. Cl. 128—734 **13 Claims**

1. In a neural stimulating apparatus of the type comprising a cathode adapted to be juxtaposed to the spinal cord in a body, in anode adapted to be placed in contact with the body, means for generating constant current output pulses which are supplied to the cathode, a cathode lead coupled between the pulse generating means and the cathode for carrying the pulses to the cathode and means for controlling (a) the generation of pulses and (b) the supplying of pulses to the cathode, the improvement comprising means coupled to the cathode lead for measuring changes in the cathode impedance at the connection of said pulse generating means to the cathode lead, said means for measuring changes in the cathode impedance comprising means for comparing the voltage pulses at which the constant



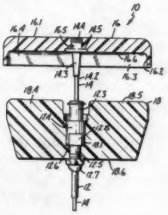
current pulses are being supplied to the load with an increasing reference voltage, means for counting the number of voltage pulses that are greater in magnitude than the increasing reference voltage over a sampling period, and means for correlating said count of pulses over the sampling period with the impedance of the load presented by the lead and connections to tissue required to generate that number of constant current pulses at the voltage required for same.

4,630,616

BONE MARROW NEEDLE

Carl W. Tretinyak, Rochester, Minn., assignor to Berkley and Company, Inc., Spirit Lake, Iowa

Continuation of Ser. No. 621,135, Jun. 15, 1984, abandoned, which is a continuation of Ser. No. 225,048, Apr. 17, 1981, abandoned. This application Aug. 19, 1985, Ser. No. 766,681
Int. Cl.⁴ A61B *10/00*
U.S. Cl. 128—753 **2 Claims**



1. A bone marrow biopsy needle assembly, comprising:

(a) an elongated tubular cannula having an axially extending bore therethrough;

(b) a cannula handle positioned on the proximal end of said cannula; wherein

(c) said cannula handle extends perpendicularly to the axis of said cannula; and wherein

(d) said cannula handle is comprised of two equal rectangular halves extending in diametrically opposed directions to each other from said cannula axis;

(e) each of said equal halves of said cannula handle having proximally extending shoulder projections substantially parallel to the axis;

(f) an orifice in said cannula handle in flow communication with said cannula bore, said orifice being coaxial with said cannula bore;

(g) a stylus handle removably positioned on the proximal end of said cannula handle; wherein

(h) said stylus handle extends perpendicularly to the axis of said cannula and includes an elongated palm contacting surface on the proximal side thereof; and wherein

(i) said stylus handle is comprised of two equal rectangular halves extending in diametrically opposed directions to each other from said cannula axis along the same diameter and substantially to the same extent as said equal halves of said cannula handle;

(j) an elongated stylus extending from the distal side of said stylus handle and slidably received within said cannula bore, said stylus having a sharpened distal tip which extends distally from the distal end of said cannula;

(k) and wherein the distal side of said stylus handle further includes recess means mated to the shouldered projections for allowing relative movement between the stylus and cannula handles only in the axial direction of siad cannula;

(l) whereby when said equal cannula handle halves are received in said recesses of said equal stylus handle halves, force may be rotatingly applied around either axial direction of said elongated stylet positioned in said elongated cannula without relative rotation of said elongated stylet and said elongated cannula.

4,630,617

HEART PACER LEAD WIRE WITH PULL-AWAY NEEDLE

Thomas A. Ritter, Bristol; James C. Bray, Danbury, and Alan L. Kaganov, Stamford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 9, 1980, Ser. No. 195,531

Int. Cl.⁴ A61N *1/04*

U.S. Cl. 128—784 **8 Claims**

1. A surgical electrode comprising:

(a) an electrically conductive wire having a first needle attached to and in electrical contact with one end of said wire;

(b) an electrically conductive connector pin permanently attached to and in electrical contact with the other end of said wire and having a blunt pointed end opposite the end attached to said wire;

(c) a second needle having a cylindrical blind hole in one end into which is inserted, with removable attachment and in electrical contact, the blunt pointed end of said pin; and

(d) a dielectric insulating coating over the exterior surface of said wire electrically insulating said wire over a major portion of the length thereof;

the removable attachment being such that the needle and pin may be readily pulled away from each other.

4,630,618

APPARATUS AND METHOD FOR FORMING A ROD OF SMOKEABLE MATERIAL

Brian C. Chard, Bristol, England, assignor to Imperial Group PLC, England

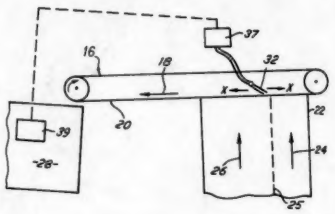
Filed Aug. 1, 1983, Ser. No. 519,317

Claims priority, application United Kingdom, Aug. 5, 1982, 8222638

Int. Cl.⁴ A24C *5/18*

U.S. Cl. 131—84.3 **12 Claims**

1. Apparatus for forming a rod of smokeable material from at least two types of smoking material comprising storage means for storing said at least two types of smoking material, an air pervious conveyor belt, a vacuum source located on one side of the belt, means located on the other side of the belt for depositing first and second types of smoking material respectively on the belt so that the second type of smoking material overlies the first type, and gate means to interrupt the deposition of the first type of material and allow predetermined



amounts of the second type of smoking material to be periodically deposited directly on the belt.

4,630,619

PROCESS FOR TREATING TOBACCO

Kevin R. Korte, Louisville, Ky., and Dan T. Wu, Surabaya, Indonesia, assignors to Brown & Williamson Tobacco Corp., Louisville, Ky.

Filed Dec. 16, 1983, Ser. No. 566,750

Int. Cl.⁴ A24B *3/18*

U.S. Cl. 131—296 **8 Claims**

1. An improved tobacco treating process comprising:

immersing a preselected tobacco product in a liquid nitrogen bath at a preselected low temperature for a sufficient period of time to cool the tobacco product in a uniform manner;

treating the cooled tobacco product with gaseous carbon dioxide at a preselected pressure and for a sufficient period of time to allow the gaseous carbon dioxide to condense evenly on the surface and into the pores of the tobacco product; and,

reducing the gaseous pressure and drying the gaseous tobacco product with hot gases to arrive at a final expanded tobacco product.

4,630,620

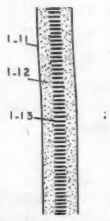
CIGARETTE WITH CONDENSING SURFACE THEREIN

Naeem B. Gabriel, 2 Kingsbury Sq., Apt. #19E, Trenton, N.J. 08611

Continuation of Ser. No. 931,102, Aug. 25, 1978, abandoned. This application Jan. 30, 1981, Ser. No. 230,360

Int. Cl.⁴ A24D *1/00*

U.S. Cl. 131—331 **2 Claims**



1. A cigarette comprising a paper wrapper surrounding a tobacco core, and a plurality of thin aluminum discs co-axially aligned along the central longitudinal axis of said tobacco core, said discs extend from one end of said core to the other end of said core.

4,630,621

METHOD AND COMPOSITION FOR SIMULTANEOUSLY PERMANENTLY WAVING AND DYEING HUMAN HAIR

Susanne Pontani, P.O. Box 758, Mars, Pa. 16046

Filed Sep. 27, 1985, Ser. No. 781,952
Int. Cl.[4] A45D 7/00
U.S. Cl. 132—7 11 Claims

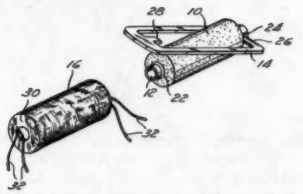
1. In the process of permanently waving hair with a reforming solution, removing said reforming solution and rebonding said hair by saturating said hair with an oxidizing rebonding agent and subsequently removing said rebonding agent, the improvement comprising contacting said hair with a dyeing composition after said reforming solution is removed from said hair but before said rebonding agent is removed from said hair.

4,630,622

HAIR ROLLING DEVICE

Adele J. Foreman, 1502 Puls, Oceanside, Calif. 92054

Filed Jul. 2, 1984, Ser. No. 627,058
Int. Cl.[4] A45D 2/02
U.S. Cl. 132—39 1 Claim



1. The improvement to reduce friction in a hair rolling device in which there is a resilient plastic foam roller having working surfaces around which hair is tightly wound and securing means operative to clamp in place hair wound around said roller, comprising:

(a) a fabric sleeve directly fitting and completely covering said working surfaces of said roller and drawstrings at the end of said sleeve releasably securing said sleeve to said roller, the fabric of said sleeve having a coefficient of static friction less than 0.900 that is lower than the coefficient of static friction of the surface of said foam roller which is substantially above 1.00 whereby hair wound around said sleeve will have less breakage than hair wound directly around said roller because hair can slip more easily in contact with said fabric than in direct contact with said foam roller under pressure of said roller tending to restore its original shape, and

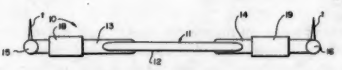
(b) a plastic hollow longitudinally-open single-walled tube on which said foam roller is mounted, said plastic tube being sufficiently resilient to collapse and to flex longitudinally under the weight of the head of a reclining user, so as to be more comfortable to such a reclining user than a rigid tube.

4,630,623

TOOTHPICK HOLDER

Joseph Hadary, 5405 Linden Ct., Bethesda, Md. 20814

Continuation-in-part of Ser. No. 476,555, Mar. 16, 1983. This application Aug. 8, 1983, Ser. No. 521,259
Int. Cl.[4] A61C 15/00
U.S. Cl. 132—89 5 Claims



1. A toothpick holder for holding toothpicks in different positions for gaining access to different portions of the mouth, comprising:

an elongate, one-piece handle having portions of polygonal cross-sectional shape to facilitate gripping thereof;

a pair of arms integral with the handle and each projecting therefrom at substantially a right angle to the axis of the handle; and

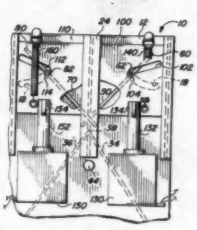
each said arm having a free end with an opening therethrough, said openings each having a polygonal cross-sectional configuration adapted to grip and hold a toothpick inserted therein in a predetermined orientation, said openings being oriented so that a toothpick inserted into one of the openings is oriented in a first position for gaining access to a first portion of the mouth and a toothpick inserted into the other of the openings is oriented for gaining access to a different portion of the mouth.

4,630,624

COIN ESCROW APPARATUS FOR COIN OPERATED EQUIPMENT

James R. Turner, 4602 E. Pueblo, Phoenix, Ariz. 85040

Filed Jan. 22, 1986, Ser. No. 820,977
Int. Cl.[4] G07D 1/00
U.S. Cl. 133—4 A 21 Claims



1. Coin escrow apparatus comprising, in combination: side panel means, including

a first side panel and a second side panel;

slot means in the side panel means including a first slot and a second slot;

first valve means pivotally secured between the first and second side panels and movable between an open and a closed position;

second valve means pivotally secured between the first and second side panels and movable between a closed position adjacent to the first valve means and an open position remote from the first valve means, and defining, with the first and second side panels and the first valve means when both the first and second valve means are in their closed position, a coin escrow box for holding coins;

first actuator panel means disposed adjacent to the first slot;

a first actuator slot in the first actuator panel means overlying a portion of the first slot;

second actuator panel means disposed adjacent to the second slot;

a second actuator slot in the second actuator panel means overlying at least a portion of the second slot;

a first cam rod secured to the first valve means and extending into the first slot and the first actuator slot for pivoting the first valve means in response to movement of the first actuator panel means;

a second cam rod secured to the second valve means and extending into the second slot and the second actuator slot for pivoting the second valve means in response to movement of the second actuator panel means;

first actuator means for moving the first actuator panel means to pivot the first valve means; and

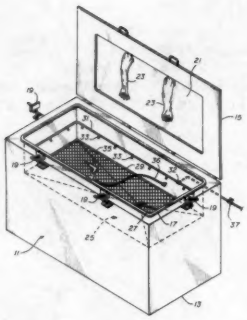
second actuator means for moving the second actuator panel means to pivot the second valve means.

4,630,625

TOOL DECONTAMINATION APPARATUS

Joseph A. Capella, Crystal River, and David E. Fowler, Gainesville, both of Fla., assignors to Quadrex HPS, Inc., Gainesville, Fla.

Division of Ser. No. 228,971, Jan. 22, 1981, Pat. No. 4,443,269.
This application Apr. 29, 1983, Ser. No. 490,243
Int. Cl.[4] B08B *3/02;* B05B *15/04*
U.S. Cl. 134—104 9 Claims



1. System for cleaning radioactively contaminated articles, which comprises:

a cleaning chamber adapted to receive and seal therein the contaminated articles,

means for spraying the contaminated articles with a high pressure spray of a clean solvent to dislodge and/or dissolve the contaminants,

means for draining the contaminated solvent from the cleaning chamber at a rate at least as great as that which the clean solvent is sprayed into the cleaning chamber,

and means for decontaminating the contaminated solvent for reuse,

a cabinet having an opening through which the articles may be placed into and removed from the cleaning chamber,

means for closing and sealing the opening,

window means for providing a view of the inside of the cleaning chamber when the opening is closed and sealed,

and glove means for permitting the manipulation of the articles within the cleaning chamber when the opening is closed and sealed,

a solvent reservoir adapted to receive contaminated solvent drained from the cleaning chamber,

filter means for removing contaminants suspended in the contaminated solvent,

and means for recirculating solvent from said solvent reservoir through the filter means,

a low pressure high volume pump having an intake connected to the pick-up tube, a first conduit connecting the discharge of the low pressure high volume pump to the filter means, and a second conduit connecting the filter means to the solvent reservoir, and

a high pressure low volume pump having an intake connected to the second conduit,

a spray gun in the cleaning chamber,

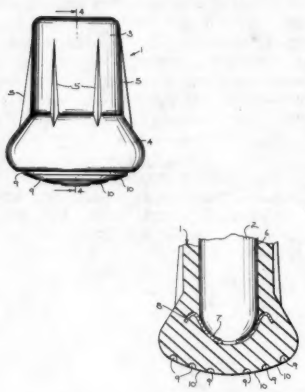
and means for connecting the discharge from the high pressure low volume pump to the spray gun.

4,630,626

CRUTCH TIP CONSTRUCTION

Ted. F. Urban, Oshkosh, Wis., assignor to Lamico, Inc., Oshkosh, Wis.

Filed Feb. 11, 1985, Ser. No. 700,277
Int. Cl.[4] A45B *9/04*
U.S. Cl. 135—84 4 Claims



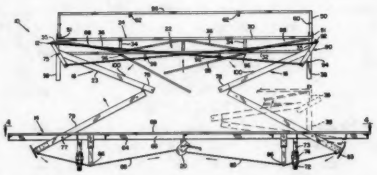
1. A crutch construction, comprising a crutch having a lower end, a resilient tip having an axial recess to receive said lower end, said recess having a bottom, and a concave metallic socket disposed at the bottom of said recess and disposed in engagement with the lower end of said crutch, said tip having an enlarged lower head terminating in a curved convex lower surface adapted to engage a supporting surface during use of said crutch, said lower surface being formed with a plurality of spaced concentric grooves, said concave socket opening upwardly and having its periphery formed with an outwardly and downwardly extending flange which is embedded within the material of said tip, and said lower end of said crutch being convex to fit the concavity of said socket.

4,630,627

COLLAPSIBLE FRAME STRUCTURE

David W. Windows, 1581 40th Ave., NW., Salem, Oreg. 97304, and Ronald E. Burback, 1202 SE. Chelsea Ave., Vancouver, Wash. 98664

Filed Jan. 7, 1985, Ser. No. 689,292
Int. Cl.[4] E04H *15/48, 15/56*
U.S. Cl. 135—112 4 Claims



1. A collapsible frame structure comprising:

an upper frame section;

a base frame section;

at least one pair of opposed hinged struts having upper and lower portions, each of the struts being hinged between its upper and lower portions, the upper portion pivotally connected to the upper frame section and the lower portion pivotally connected to the base frame section, the hinged struts being adapted to extend to raise the upper

section to an operative frame position above the base frame section and being collapsible to lower the upper section to a stored position;

a stabilizing plate fixedly mounted adjacent each upper portion of a strut each said plate with an upper and a lower portion;

winch means mounted to the base section and connected to ends of the lower portions of the hinged struts for pivoting the lower portions to extend the struts; and

a pair of stabilizing members linking the upper portions of the struts of the pair to equalize the angular movement of each upper strut portion relative to each hinged lower strut portion, as the struts extend, one of the members being connected to the upper portion of one plate and to the lower portion of the other plate, the other of the members being connected to the upper portion of the other plate and to the lower portion of the one plate, the members crossing each other intermediate the plates.

4,630,628

FLOW CONTROL APPARATUS

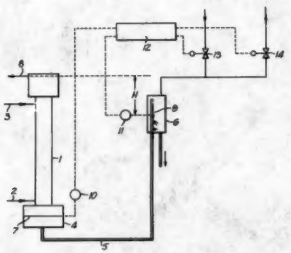
Ian C. Hepworth, Norley, England, assignor to British Nuclear Fuels plc, Risley, England

Filed May 7, 1984, Ser. No. 607,823

Claims priority, application United Kingdom, May 24, 1983, 8314319

Int. Cl.⁴ F17D *3/00*

U.S. Cl. 137—12 **5 Claims**



1. In combination, a vertical solvent extraction column in which an interface between a light phase and a heavy phase forms during operation, flow control means for maintaining the level of the interface at a predetermined level and an outlet for the light phase, said flow control means comprising a pressure vessel located outside the column at an elevated position relative to the predetermined interface level, means forming a flow path between the base and interior of the solvent extraction column and the base and interior of the pressure vessel to permit flow from the column to enter the pressure vessel, means having a plurality of vertically spaced apart apertures in the flow path within the vessel so that fluid entering the vessel will sequentially reach and flow in parallel through the apertures depending on the liquid level in the flow path within the vessel, and means for selectively varying the pressure within the vessel to control the liquid level in the flow path in the vessel, and hence for varying the parallel flow through the apertures, so that the interface in the column is maintained at the predetermined level.

5. A method of controlling the level of an interface between a light phase and a heavy phase in a vertical solvent extraction column comprising locating a pressure vessel outside the column at an elevated position with respect to the interface, and locating an outlet for the light phase above the bottom of the column, providing a flow connection between the bottom and interior of the column and the bottom and interior of the vessel to permit flow from the column to enter the vessel, arranging a means having a plurality of vertically spaced apart apertures in parallel flow relationship in the flow path in the vessel so that fluid entering the vessel will sequentially reach and flow in parallel through the apertures depending on the liquid level in the flow path within the vessel, and selectively varying the pressure within the vessel to control the liquid level in the flow path in the vessel and hence to control the parallel flow through the apertures, so that the interface is maintained at a substantially constant level.

4,630,629

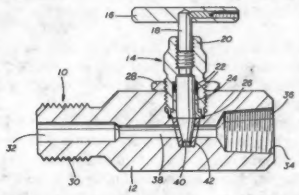
VALVE WITH COMPRESSIBLE VALVE STEM AND VALVE BODY SEALS

Spencer M. Nimberger, Houston, Tex., assignor to General Screw Products Company, Houston, Tex.

Filed Mar. 7, 1986, Ser. No. 837,387

Int. Cl.⁴ F16K *41/00, 51/00*

U.S. Cl. 137—15 **20 Claims**



15. A method of sealing fluid within a valve of a type including a valve body having a fluid inlet and a fluid outlet, a valve seat, a valve bonnet for removable engagement with said valve body, a valve stem having a central axis movable relative to said bonnet, and sealing surface on said valve stem for sealing engagement with said valve seat, the method comprising:

providing a first compressible seal between said bonnet and said valve body for sealing between said bonnet and said valve body;

providing a second compressible seal between an end surface of said valve bonnet and said valve body;

providing a retainer axially positioned relative to said valve bonnet and in engagement with said valve body upon movement of said valve bonnet; and

selectively axially moving said bonnet relative to said valve body and thereby simultaneously sealingly compressing both said first seal and said second seal.

4,630,630

HYDROSTATIC HYDRAULIC COUPLING

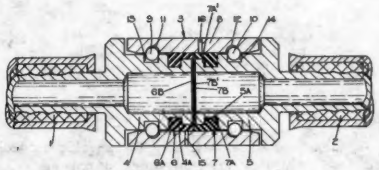
Desmond H. J. Reynolds, and Philip A. Taft, both of West Midlands, England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Feb. 4, 1985, Ser. No. 697,767

Claims priority, application United Kingdom, Feb. 8, 1984, 8403370

Int. Cl.⁴ F16K *17/14*

U.S. Cl. 137—68.1 **11 Claims**



1. A connector for use in a hydraulic system comprising:

first and second body members forming parts of the hydraulic system and each having first and second channel

means, respectively, through which hydraulic fluid passes when in use;

a first and second diaphragm mounted on said first and second body members, respectively, and between said first and second channel means for sealing said first and second channel means to prevent flow of fluid therethrough;

a tubular sleeve coupling member having open ends into which said body members are insertable for coupling said first and second body members together in a coupling position so that said diaphragms are in contiguous relationship;

means integral with each respective diaphragm to cause rupture of each diaphragm, respectively, at a predetermined hydraulic system pressure to facilitate flow through and between said first and second channel means in use;

first sealing means for each of said first and second body members forming a fluid-tight seal between the respective body member and the inner surface of said tubular sleeve coupling member surrounding said respective body member;

at least one normally closed air leakage path which, when open, provides communication between the ambient atmosphere and space between said body members and said diaphragms;

second sealing means operatively disposed in said at least one air leakage path for normally closing said air leakage path when said tubular sleeve coupling member is applied for coupling said first and second body members together, and for allowing air entrapped between said body members and said diaphragms to be expelled through said path; and

at least one locking device operatively engageable between at least one of said first and second body members and said tubular sleeve coupling members for locking said at least one body member and said tubular sleeve coupling member against relative axial and rotational movement comprising,

grooves formed respectively in said tubular sleeve coupling member and said at least one of said body members, said grooves being positioned to be juxtaposed when said at least one of said body members is in said coupling position in said tubular sleeve coupling member, and

a U-shaped clip removably engageable in said grooves.

4,630,631

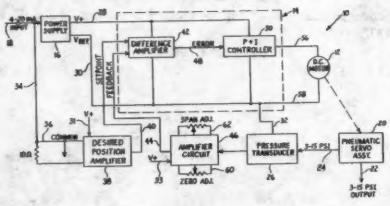
PNEUMATIC SERVO ASSEMBLY FOR AN ELECTRO-PNEUMATIC CONVERTER

Christine B. Barnes, Wickliffe, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 637,948, Aug. 6, 1984, abandoned, which is a division of Ser. No. 469,200, Feb. 24, 1983, abandoned. This application Feb. 20, 1986, Ser. No. 833,505

Int. Cl.[4] G05D *16/00*

U.S. Cl. 137—85 **11 Claims**



1. A pneumatic servo assembly for an electropneumatic closed loop control system providing a pneumatic output signal in response to a corresponding input signal comprising:

variable restriction means for producing different pneumatic output signals from the pneumatic servo assembly;

motor means for moving said variable restriction means to vary the pneumatic output from the pneumatic servo assembly, said motor means having a cam assembly connected thereto for variably restricting the pneumatic servo assembly depending on the position of the cam;

a backpressure nozzle mounted proximately to said cam assembly to be variable restricted by said cam assembly;

means for actuating said motor means in response to a control signal;

means for establishing a set point signal in response to the electrical input signal indicative of a desired pneumatic output signal;

means for establishing a feedback signal indicative of the pneumatic output signal;

combining means for comprising the setpoint signal with the feedback signal to establish a control signal to said actuating means; and

a nozzle clamp for exerting drag on the cam assembly to maintain a constant pneumatic output signal from said pneumatic servo assembly corresponding to the last control signal to said pneumatic servo assembly in response to an electrical failure.

4,630,632

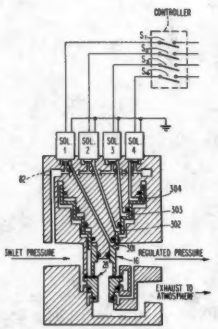
PRESSURE REGULATOR

John L. Johnson, Morrisville, N.C., assignor to Schrader Bellows Inc., Akron, Ohio

Filed Nov. 26, 1984, Ser. No. 674,742

Int. Cl.[4] F16K *31/363*

U.S. Cl. 137—85 **17 Claims**



1. A fluid pressure regulator comprising:

(a) body having;

an outlet connected to the upper side of a downward-facing first valve seat formed inside the body,

an inlet connected to the lower side of the seat, the body presenting an inner and outer concentric annular upward guide walls in the housing below and aligned with the first seat and partly defining between them an outlet pressure chamber connected to the outlet and defining inside the inner wall an exhaust chamber connected to the exterior of the body, the inner wall being shorter than the outer wall, and

an inverted stepped cone-like projection formed in the body and extending downward and aligned with and above the first seat, the projection having a plurality of generally cylindrical faces of increasing diameter as the upper end of the projection is approached and a plurality of passage means in the projection all having one end terminating respectively in openings adjacent the faces,

(b) a vertically reciprocable valve member having;

an axial passage and an upwardly facing annular sealing surface adapted in its upper position to engage upward against the first seat,

beneath the sealing service an upper piston cooperating with the outer of the concentric walls and adapted to be urged

upward by the outlet pressure in the outlet pressure chamber, and

a lower piston cooperating with the inner of the walls,

(c) a valve actuator in the housing adapted to be urged upward by the outlet pressure and having;

a stepped inner shape comprising spaced annular horizontal surfaces, the actuator reciprocably receiving the cone-like projection, and

terminating in a downward annular second seat adapted in the lower position of the actuator to engage downward against the sealing surface of the valve member inside the first seat,

(d) a plurality of control valve means connected between the inlet and respectively the plurality of passage means; and

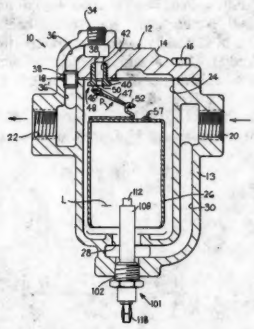
(e) a plurality of seal means disposed between the projection and the actuator to isolate pressurewise chambers partly defined by individual annular horizontal surfaces of the actuator from chambers partly defined by other annular horizontal surfaces, whereby the outlet pressure may be precisely controlled depending on the selected one or number of control valve means in the "off" or "on" mode.

4,630,633

STEAM TRAP CHECKER

Stafford J. Vallery, New Braunfels, Tex., assignor to Armstrong International, Inc., Three Rivers, Mich.

Filed Sep. 13, 1985, Ser. No. 775,903
Int. Cl.[4] F17T *1/28*
U.S. Cl. 137—185 **14 Claims**



1. In combination, a steam trap and apparatus for checking same for steam leakage, comprising:

a steam trap casing having an inlet for steam and condensate and an outlet for condensate;

a steam trap means in said casing operative independent of said probe and by itself responsive to accumulation of a preselected amount of condensate in said casing for releasing condensate to said outlet while trapping steam in said casing, said steam trap means constituting the entirety of a normally operational steam trap mechanism including a condensate outlet valve normally closing said outlet and actuating means for actuating said valve to release condensate therethrough to said outlet;

a probe extending into said steam trap casing and responsive to condensate build up to an excessive level in said steam trap casing for changing an electrical condition;

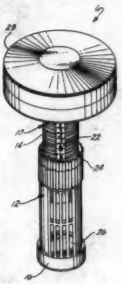
means responsive to said electrical condition change for indicating said steam trap means has a fault condition, said steam trap comprising an inverted bucket steam trap, said actuating means comprising a downward opening inverted bucket vertically movable in said casing, a passage from said inlet which opens under said inverted bucket to supply steam and condensate, means connecting said condensate outlet valve to said inverted bucket for opening and closing said valve in response to low and high positioning of said inverted bucket in said steam trap casing, said probe having a condensate level sensing part extending up in noninterfering relation into the open bottom of said inverted bucket and responsive to the condensate level within said inverted bucket.

4,630,634

SOLID CHLORINE DISPENSER FOR SPAS

Isao Sasaki, Altadena, and Michael L. Schuman, Walnut, both of Calif., assignors to Rainbow Lifegard Products, Inc., El Monte, Calif.

Filed Dec. 2, 1985, Ser. No. 803,635
Int. Cl.[4] B01D *11/02*; B01F *1/00*
U.S. Cl. 137—268 **3 Claims**



1. A reusable device for dispensing a solution derived from a solid into a body of water, comprising:

a tubular container having a closed end and an open end;

a sleeve having one closed end and one open end threadable at the open end thereof onto the open end of the container so that the sleeve and the container define a chamber of variable length for receiving the solid;

apertures in the walls of the sleeve proximately adjacent to the closed end of the sleeve where the degree of closure of the apertures is variable from a fully closed position to a fully open position dependent upon the location of the sleeve axially on the container;

a float member larger in diameter than the container filled with foam attached to the container at the closed end thereof;

ballast contained within the sleeve adjacent the closed end thereof;

the float member, ballast and structure and material of the container and sleeve being cooperatively defined to cause the device to float erect, with the sleeve closed end down, irrespective of the quantity of solid in the chamber and irrespective of the presence or absence of air in the chamber above the open end of the container; and

a nut cooperable between the container and the sleeve for securing the sleeve in a desired location on the container.

4,630,635

FLOW DEVICE WITH RESILIENT ELASTOMERIC SLEEVE

Robert E. Berastein, Framingham, and Alan E. Nelson, Franklin, both of Mass., assignors to Larad Equipment Corporation, Medfield, Mass.

Continuation of Ser. No. 441,613, Feb. 11, 1983, abandoned. This application Aug. 23, 1985, Ser. No. 769,783
Int. Cl.[4] F16K *43/00*
U.S. Cl. 137—315 **15 Claims**

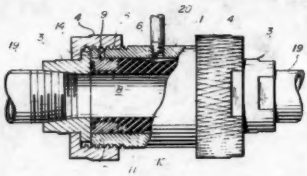
2. A flow device with a resilient elastomeric sleeve for use in a pipe system comprising:

a hollow housing having openings at opposite ends and inner

circular wall portions at the ends and a generally central opening for communicating with a motive fluid line;

a removable flexible resilient elastomeric sleeve inside the housing, defining a motive fluid space between the sleeve exterior and the interior of the housing and having a rigid annular portion proximate to each end of the sleeve and integral therewith, each rigid annular portion being radially concentrically aligned in the housing at a respective one of the circular wall portions;

exterior sealing means near each end of the sleeve acting circumferentially between the respective rigid annular portion and inner circular wall portion for sealing the motive fluid space between the sleeve and the housing independently of any portion of the piping system in which the flow device is used;



releasable means co-acting with the housing and the sleeve for fixing the axial position of said exterior sealing means relative to the housing; and

means for sealing the device when mounted in a pipe system effective to seal process material flowing through the device against leakage;

whereby when the device is off-line it may be tested maintaining effective seal of motive fluid in the motive fluid space due to the sealing effect of the exterior sealing means between the housing and the sleeve, and when the device is online the seal is also maintained, and the device may be installed in or removed from a pipe system while maintaining the exterior seal.

4,630,636

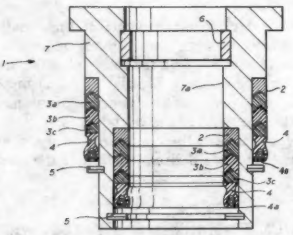
ACTUATOR WITH NONELASTOMERIC SEAL

Dennis R. Cutcher, Gretna, La., assignor to Baker CAC, Belle Chasse, La.

Filed Nov. 16, 1983, Ser. No. 552,248

Int. Cl.[4] F16K *43/00, 41/00*

U.S. Cl. 137—315 **3 Claims**



1. A non-elastomeric self-energizing annular seal system for use in establishing sealing integrity between concentric tubular members defining a passage exposed to high fluid pressures, comprising:

a first deformable non-elastomeric seal element mounted between said tubular members adjacent the high pressure end of the seal system;

a radially expandable, metallic spring member radially biasing only said first non-elastomeric seal element into radial sealing contact with the concentric tubular members without applying an axially biasing force to the seal system, but permitting axial movement of said first non-elastomeric seal element by said high fluid pressure; additional deformable non-elastomeric annular seal elements axially contiguous to each other and to the first non-elastomeric seal element, said additional seal elements being freely insertable between said tubular members; a metallic element at the low pressure end of the seal system limiting axial movement of said non-elastomeric seal elements; and interfitting convex and concave surfaces on the additional non-elastomeric seal elements and the metallic element, oriented with the elements more closely adjacent the high pressure end urging adjacent elements radially in contact with said concentric tubular elements when subjected to loading by axial movement of said first non-elastomeric seal element produced by said high fluid pressure.

4,630,637

GAS FLOW REGULATOR FOR GASES WITH CONDENSABLE COMPONENTS

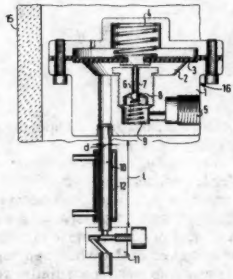
Leander Furst, Jülich, Fed. Rep. of Germany; Johan T. G. Ballast, Veenendaal, Netherlands, and Kurt Jahnel, Düsseldorf-Itter, Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich GmbH, Julich and Brooks Instrument, Zweigniederlassung Elmshorn der Emerson Electric GmbH, Elmshorn, both of, Fed. Rep. of Germany

Filed Sep. 13, 1985, Ser. No. 775,736

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1984, 3434024

Int. Cl.[4] F16K *49/00*

U.S. Cl. 137—340 **8 Claims**



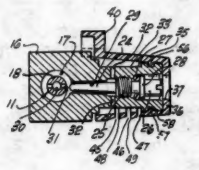
1. In a gas flow regulator for a gas with a condensable component comprising a spring-loaded membrane bounding a gas-receiving chamber, said spring-loaded membrane being subjected to the pressure of said gases, a controlling inlet valve positioned adjacent said membrane and a restrictor positioned downstream from said chamber constricting flow of said gas, the improvement which comprises for the condensation of said condensable component a cooled cooling section positioned substantially vertically and connected between said gas-receiving chamber and said restrictor, from which all condensate formed directly reaches by the action of the force of gravity the region underneath a gas flow regulator mechanism formed by said chamber, membrane and inlet valve.

4,630,638

ROTATING CAP, SCREEN AND MOUNTING MEANS FOR PROTECTING AIR METERING VALVE

V. Walter Hafner, Whittier; Ron T. Hahn, Fullerton, and Keith D. Marshall, Whittier, all of Calif., assignors to Acorn Engineering Company, City of Industry, Calif.

Filed Jan. 28, 1986, Ser. No. 823,392
Int. Cl.[4] F16K *27/08*
U.S. Cl. 137—381 16 Claims



1. An improved needle valve of the type useful for metering the flow of air into a controlled device, said needle valve being of the type having an adjustable needle held in a housing connected to an air line, said housing having an air inlet orifice therein, wherein the improvement comprises:

a cap for protecting an air metering valve from liquid or foreign objects comprising:

a generally cylindrical body having a generally circular base having a distinctive marking protrusion thereon, said cylindrical body having a central axis and a generally cylindrical sidewall having at least one circumferentially oriented slit formed therein, said slit covering no more than about half of the circumference; and

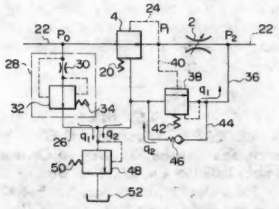
holding means for holding said cap on said housing at a location so that said generally cylindrical sidewall extends over said air inlet orifice of said housing, said holding means permitting the rotation of said generally cylindrical body about its central axis.

4,630,639

APPARATUS FOR CONTROLLING PRESSURE AND FLOW RATE

Yoshisuke Akita; Ichiro Tenmyo; Kiyoshi Hayashi; Kazuyuki Kihara, and Akio Mito, all of Tokyo, Japan, assignors to Tokyo Keiki Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1985, Ser. No. 716,377
Claims priority, application Japan, Mar. 30, 1984, 59-62811
Int. Cl.[4] F16K *31/36*
U.S. Cl. 137—486 2 Claims



1. An apparatus for controlling a pressure and a flow rate comprising:

a main passage having an upstream end and a downstream end for flow of fluid therein;

a variable throttle interposed in said main passage for adjusting a flow rate of fluid through said main passage, said variable throttle having an input port and an output port;

a differential pressure regulator interposed in said main passage in series with and upstream from said variable throttle, said differential pressure regulator having a primary pilot chamber in fluid communication with said input port of said variable throttle and a secondary pilot chamber with a differential pressure setting spring disposed within said secondary pilot chamber;

a constant flow control valve having an input port in fluid communication with said main passage upstream from said differential pressure regulator and an output port for fluid communication with said secondary pilot chamber of said differential pressure regulator, said constant flow control valve allowing fluid at a constant flow rate to pass through said output port thereof;

first fluid passage means connecting said output port of said constant flow control valve to said secondary pilot chamber of said differential pressure regulator;

second fluid passage means connecting said secondary pilot chamber of said differential pressure regulator to said main passage downstream from said output port of said variable throttle;

a sequence valve means, interposed in said second fluid passage means connecting said secondary pilot chamber of said differential pressure regulator to said main passage downstream of said variable throttle, for detecting front-to-back differential pressure of said variable throttle and for controlling the amount of fluid supplied from said constant flow control valve to said secondary pilot chamber of said differential pressure regulator due to a throttle operation of said sequence valve means in response to said front-to-back differential pressure of said variable throttle, whereby said front-to-back differential pressure is held to a constant value corresponding to a set flow rate of said variable throttle;

a tank for storage of fluid;

a third fluid passage means connecting said output port of said constant flow control valve to said tank;

a relief valve interposed in said third fluid passage means connecting said output port of said constant flow control valve to said tank, said relief valve being set to a predetermined relief pressure for allowing fluid to pass to said tank when pressure at said output port of said constant flow control valve exceeds said predetermined relief pressure;

fourth fluid passage means connecting said main passage downstream of said variable throttle to said relief valve; and

a check valve interposed in said fourth fluid passage means connecting said main passage downstream of said variable throttle to said relief valve, said check valve being set to a predetermined pressure for allowing fluid to pass from said main passage downstream of said variable throttle to said relief valve when a predetermined differential pressure exists on either side of said check valve.

4,630,640

PRESSURE COMPENSATED RESTRICTIVE FLOW REGULATOR CARTRIDGE

Ernest A. DiBartolo, Sarasota, Fla., assignor to Sun Hydraulics Corp., Sarasota, Fla.

Filed Jun. 10, 1985, Ser. No. 743,293
Int. Cl.[4] F16K *31/363*
U.S. Cl. 137—501 18 Claims

1. A flow regulator cartridge for use in a manifold having fluid passages forming fluid ports which cooperate with valve openings, said cartridge comprising:

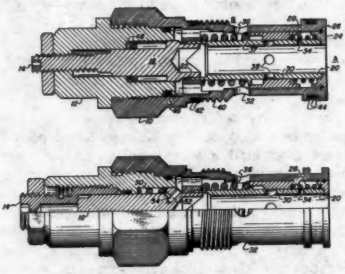
a valve body having a first portion to be disposed in the manifold and a second portion to be extended from the manifold;

means for sealingly securing said valve body in the manifold;

said valve body having an opening to port A at the end of said portion to be disposed in the manifold and an opening to port B on the side of said portion to be disposed in the manifold;

a stem longitudinally extending in said valve body from an

outer end at port A to an inner end, providing a fluid passage therethrough;
a valve element providing a preset flow control orifice between said inner end of said stem and port B;
a compensating spool slideably mounted to control the opening to port B;
said compensating spool having a first annular area which will bias it, under the influence of fluid pressure, to decrease the opening to port B;
first passage means through the wall of said stem for admitting fluid from port A to exert fluid pressure against said first annular area of said compensating spool;



second passage means through the wall of said stem for admitting fluid from port B to said stem;
said compensating spool closing said second passage means when the fluid pressure at port A is greater than the fluid pressure at port B, and opening said second passage means when the fluid pressure at port B is greater than the fluid pressure at port A;
said compensating spool having a second annular area which will bias it, under the influence of fluid pressure, to increase the opening to port B; and
a control spring biasing said compensating spool to increase the opening to port B.

4,630,641

PRESSURE-REDUCING APPARATUS

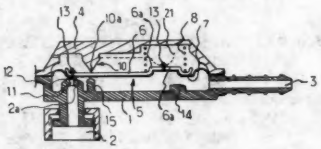
Gilbert Lacour, Rueil Malmaison, France, assignor to Clesse-Mandet, France

Filed Jan. 15, 1985, Ser. No. 691,581

Claims priority, application France, Jan. 19, 1984, 84 00819; Dec. 14, 1984, 84 19207

Int. Cl.⁴ F16K *35/361*

U.S. Cl. 137—505.38 **2 Claims**



1. A gas-pressure reducing apparatus comprising a casing having a gas inlet connection and a gas outlet connection, a cover mounted upon said casing, a manometric membrane mounted between the casing and the cover and comprising two faces subjected to the pressure of the gas to be controlled and to the action of an adjustment spring respectively, abutment means extending from said cover towards the interior of the apparatus and onto which the membrane is adapted to bear and pivot, the position of said abutment means being such that it divides the membrane into two unequal surfaces comprising a relatively large surface subjected to the action of said adjustment spring and a relatively small surface adapted to close the gas inlet into the casing of the apparatus, wherein said casing is provided with one stop member extending therefrom and directed towards the membrane at a position located below, and substantially aligned with, said abutment means so as to positively prevent said membrane from closing said gas inlet connection when the membrane is collapsed under the action of said spring within the casing of the apparatus.

4,630,642

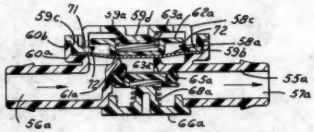
CHECK VALVE AND WATER INJECTION SYSTEMS AND FUEL SYSTEMS UTILIZING THE SAME

Charles A. Detweiler, Durand, Mich., assignor to Tom McGuane Industries, Inc., Madison Heights, Mich.

Filed Dec. 3, 1984, Ser. No. 677,289

Int. Cl.⁴ F16K *31/12*

U.S. Cl. 137—506 **6 Claims**



1. A check valve including
a valve body having an inlet and an outlet,
a seat separating the inlet and the outlet,
a valve member,
and yielding means external of the flow of the inlet, outlet and seat yieldingly urging the valve member into engagement with the seat,
said valve body being made of plastic material,
said valve body including a peripheral flange,
a cover being made of plastic,
said cover having a complementary flange overlying said flange,
a diaphragm interposed between said flanges,
said body including an annular wall surrounding said flange thereon,
said cover including a complementary annular wall ultrasonically welded to said annular wall of said body,
said body having an integral annular set,
a pressure member associated with said diaphragm on the side opposite said seat,
yielding means comprising a spring interposed between said cover and said pressure member,
said cover and said pressure member having interengaging means defining a subassembly preventing movement of said pressure member axially out of said cover so that the subassembly can be handled before the cover is ultrasonically welded to the body.

4,630,643

VALVE, PARTICULARLY MIXING VALVE

Werner Lorch, Schramberg, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany

Filed Oct. 24, 1983, Ser. No. 544,872

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1982, 3239301

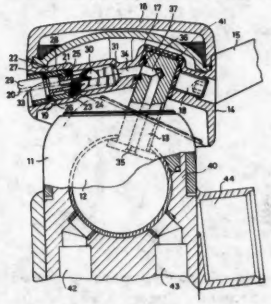
Int. Cl.⁴ F16K *21/00, 11/072*

U.S. Cl. 137—597 **8 Claims**

1. A mixing valve for attachment to a water faucet or the like, comprising:
a valve casing having a water outlet and two water inlets;
a control member having an interior liquid mixing chamber rotatably mounted in said casing between said inlets and said outlet for mixing and controlling the water, said control member comprising a spherical plug valve;

means for connecting a supplemental apparatus in communication with the interior of said mixing chamber, said means having a quick-action coupling means, and

handle means interposed between the control member and said connecting means, said handle means being associated



with said control member through a hollow rod, said rod engaging an opening in said control member and having a bore therethrough for communicating the mixing chamber and said connecting means, whereby fluid from said mixing chamber passes through said rod and connecting means to said supplemental apparatus.

4,630,644

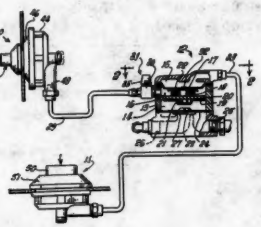
DUAL OPERATED METERING VALVE CONNECTED TO BOTH A HAND OPERATED PUSH BUTTON AND A FOOT OPERATED PUSH BUTTON

V. Walter Hafner, Whittier; Ron T. Hahn, Fullerton; Keith D. Marshall, Whittier, and Theodore J. Sally, Graton, all of Calif., assignors to Acorn Engineering Company, City of Industry, Calif.

Filed Jan. 27, 1986, Ser. No. 822,392

Int. Cl.[4] F16K *31/326*

U.S. Cl. 137—624.11 **8 Claims**



1. An improved, remote controlled valve and dual push button assembly, the remote controlled valve being of the type which has a valve diaphragm including a closeable opening therethrough, said diaphragm being in the middle of a chamber which divides the chamber into an upper chamber and a lower chamber, wherein when the valve diaphragm moves downwardly, a magnet attracts a pilot orifice plate positioned below said chamber, causing the valve to open, and when the pressure on both sides of the valve diaphragm is equalled, the valve diaphragm moves upwardly releasing the pilot orifice plate, thereby closing the valve and the push buttons connected to said valve being a hand operated push button of the type which contains a hand button diaphragm which, when depressed, ejects a small volume of control air and then, when released, intakes the same volume of air, which hand operated push button is connected to the lower of said chambers and, upon intake, pulls the valve diaphragm downwardly causing the magnet to attract the pilot orifice plate, thereby holding the valve open for an amount of time required for metered air to pass through a needle valve to release the pilot orifice plate, and the second push button being a foot operated button of the type which contains a foot button diaphragm which, when depressed by a piston, ejects a small volume of control air, which foot operated button is connected to the upper of said chambers and when the small volume of air is injected into the upper chamber, the valve diaphragm is moved downwardly for as long as the foot button is held down, wherein the improvement comprises:

air vent means in said foot operated button to permit the escape of air initiated by the depressing of the hand operated push button, which air has passed through the closeable opening in the valve diaphragm, and to allow the escape of such air through said foot operated button when said foot operated button is in its non-depressed configuration, said air vent means comprising:

an opening through the foot button diaphragm at about the axial center thereof; and

a piston having a circular contact face which contacts the diaphragm when the piston is depressed, said piston having at least one groove passing from about the center thereof, extending away from the center an amount sufficient to provide free passage of air from the opening in the foot button diaphragm along the groove to the atmosphere when said piston is in its uppermost or non-depressed position, said groove not extending to the exterior periphery of said contact face of said piston so that when said piston is held in its downward position, no air escapes through the opening in the foot button diaphragm.

4,630,645

PNEUMATIC SWITCHING DEVICE, E.G., FOR SAFEGUARDING AGAINST OVERPRESSURE

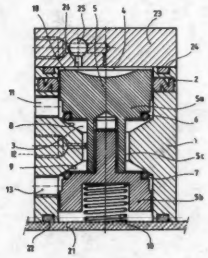
Lambertus K. J. Spa, The Hague, Netherlands, assignor to Beta B.V., The Hague, Netherlands

Continuation of Ser. No. 414,050, Sep. 2, 1982, abandoned. This application Apr. 19, 1985, Ser. No. 724,798

Claims priority, application Netherlands, Mar. 17, 1982, 8201105

Int. Cl.[4] F15B *13/042*

U.S. Cl. 137—625.6 **1 Claim**



1. A pneumatic switching device comprising a housing having a bore, a piston mounted for axial movement within said bore between first and second spaced-apart positions, said piston having a narrowed portion intermediate its ends, the piston having axially spaced-apart sealing means in the narrowed portion, said bore having a pair of seats cooperating with said axially spaced-apart sealing means to provide a seal with one of said seats upon movement of the piston to a first of said spaced-apart positions and with the other of said seats upon movement of the piston to the second of said spaced-apart positions, said housing having an outlet aperture in communication with the bore intermediate said seats and a pair of signal pressure apertures spaced axially of the bore on opposite

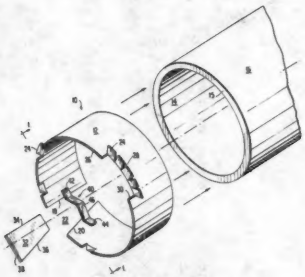
sides of said outlet aperture, and axially outboard of said pair of seats, the piston and the bore being configured to open one of said signal pressure apertures for communication with the outlet aperture and to close the other signal pressure aperture when the piston is in said first position and to close the opened signal pressure aperture and open the closed signal pressure aperture when the piston is in said second position, means biasing the piston to the first of said spaced-apart positions, a chamber at the end of the bore towards which the piston is biased, a pilot passage independent of said apertures for admitting a gas under pressure to said chamber, a vent passage for venting said chamber, a vent valve in said vent passage, said vent passage having a cross-sectional area which is large in relation to the cross-sectional area of said pilot passage, a vent valve actuating means operable to close said vent valve to effect movement of the piston to the second of said spaced-apart positions under influence of said pilot pressure in response to one pressure condition and to open said valve in response to another pressure condition to allow movement of the piston to the first of said positions under influence of said biasing means, and means including said piston for isolating said apertures from said chamber, said vent valve actuating means comprising a lever, a pivotal connection for pivotally connecting the lever to the housing, said vent valve having an actuating pin projecting from the housing and being movable to open said vent valve, the lever being in engagement with the actuating pin at a point on the lever remote from the pivotal connection, a second actuating pin engageable with said lever at a point intermediate the pivotal connection and point of engagement with the actuating pin, movement of said second actuating pin causing pivotal motion of said lever and movement of said first-named actuating pin to open said vent valve.

4,630,646

BEVEL END PROTECTOR

Siegfried E. Koehle, Panama City, Fla., assignor to Berg Steel Pipe Corp., Panama City, Fla.

Filed Oct. 22, 1985, Ser. No. 790,274
Int. Cl.[4] F16L *55/10*
U.S. Cl. 138—96 R **10 Claims**



1. A bevel end protector for protecting the bevel end of a pipe comprising:

a circumferentially expansible, collar-like means, having spaced apart ends and being adapted for insertion into the pipe, for protecting the end of the pipe;

wedge means adapted to be received between said space-apart ends, for applying an initial expanding force to expand the circumference of the collar-like means to equal the circumference of the interior of the pipe; and

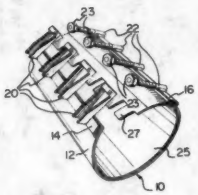
urging means, adapted to connect said spaced-apart ends, said urging means being structurally deformable for thereafter maintaining said initial circumferentially expanding force on said collar-like means whereby said wedge means is removable.

4,630,647

PIPE REPAIR CLAMP

David G. Thomson, Cambridge, Canada, assignor to Waltec Inc., Cambridge, Canada

Filed Nov. 27, 1985, Ser. No. 802,470
Claims priority, application Canada, Jan. 2, 1985, 471308
Int. Cl.[4] F16L *55/16*
U.S. Cl. 138—99 **8 Claims**



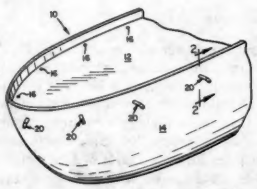
1. A pipe repair clamp comprising a metal band adapted to be wrapped around a pipe and having first and second longitudinally extending edge portions and first and second lug bars, said first and second longitudinally extending edge portions being secured to said first and second lug bars, said first lug bar having attached to it a plurality of fingers and said second lug bar having attached to it a plurality of threaded bolts each provided with a nut/washer assembly, each finger being generally U-shaped including a base portion and two leg portions extending from said base portion, said leg portions having top edges and bottom edges and first and second ends, said first ends being adjacent said base portion, said bottom edges being secured to said first lug bar adjacent said second ends, said leg portions converging over a part of their length from a first spacing in the region of said base portion sufficient to accommodate one of said nut/washer assemblies to a second spacing in the region of said first lug bar sufficient to accommodate one of said bolts but not said one of nut/washer assemblies, said top edges sloping outwardly with respect to said bottom edges along said part of the length of said leg portions, said second ends being substantially flat and having tabs in the region of said top edges, said flat ends accommodating said washers and said tabs restraining said washers against outward movement when said clamp is closed.

4,630,648

DECK DRAIN BY-PASS PLUG

Herbert E. McCord, 28306 NE. 112th, Battleground, Wash. 98604

Filed Jan. 7, 1985, Ser. No. 689,225
Int. Cl.[4] F16L *55/07*
U.S. Cl. 138—103 **10 Claims**



1. For use with a ship deck drain having a bore wall which terminates at a drain opening in an exterior surface of the ship's hull, an apparatus to drain any fluid accumulating in the ship deck so as to facilitate the repair of such surface comprising:

conduit means having a first portion with an inlet end insertable coaxially into said ship deck drain and a second portion with an outlet end extending away from said ship deck drain and hull, said conduit means defining a bore

through which fluid is permitted to flow by gravity away from said ship drain opening and hull to drain;

inflatable sleeve means surrounding and in coaxial relationship with said first portion of said conduit means;

sleeve inflating means for inflating said sleeve means under pressure such that said sleeve means expands to contact said ship bore wall to provide a fluid-proof barrier between said conduit means and ship bore wall, whereby fluid in said deck drain is permitted to drain only through said conduit means away from the hull and not down the ship's exterior surface; and

collar means extending radially from an outer surface of said conduit means to support opposite ends of said sleeve means;

said collar means including a first collar for supporting the end of said sleeve means closest to said inlet end and a second collar for supporting the other end of said sleeve means, said conduit means and first collar being threaded such that said first collar is threadably mounted on said conduit means, whereby said first collar is detachable from said conduit means.

4,630,649

GUIDE TUBE FOR INDUSTRIAL ENDOSCOPE

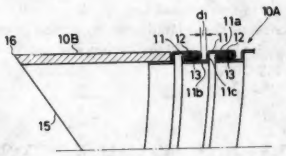
Toshio Oku, Tokyo, Japan, assignor to Kabushiki Kaisha Machida Seisakusho, Tokyo, Japan

Filed Apr. 26, 1985, Ser. No. 727,545

Claims priority, application Japan, May 2, 1984, 59-64483[U]

Int. Cl.⁴ F16L *55/00*

U.S. Cl. 138—122 **3 Claims**



1. A guide tube for guiding the movement of an endoscope into a passageway which comprises a tubular body having:

a front end slanted with respect to an axis thereof, at least that portion of said tubular body adjacent to said front end being axially compressible resiliently and resiliently bendable, and

a strip formed into a spiral configuration, each adjacent turns of said spiral strip being movable toward each other a predetermined distance to allow the axial compression of said body, said strip having a pair of first and second engaging portions formed along opposite lateral edges thereof, said first and second engaging portions of each adjacent turns of said spiral strip being engaged with each other in a manner to hold the spiral strip in a slightly axially compressed condition.

4,630,650

SPIRAL RIBBED PIPE

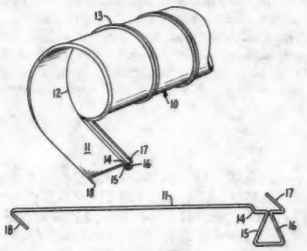
Paul K. Davis, Alameda, Calif., assignor to Pacific Roller Die Co., Inc., Hayward, Calif.

Filed Oct. 15, 1984, Ser. No. 660,637

Int. Cl.⁴ F16L *11/16*

U.S. Cl. 138—154 **10 Claims**

1. A spiral ribbed pipe formed from an elongated strip coiled helically, said pipe having a helical sam and an integral reinforcing rib formed helically along said seam, said helical seam comprising interlocking edges of said coiled strip, said integral reinforcing rib being formed adjacent one edge of the elongated strip, the improvement wherein each rib comprises a pair of leg portions of substantially equal length, the radially inward end of each leg being offset approximately three strip thicknesses from the inner surface of the pipe, said interlocking edges of said coiled strip being located between the ends of said leg portions and the inner surface of said pipe, whereby



the inner surface of each coil of said coiled strip is longitudinally aligned with the surfaces of adjacent coils to provide a smooth interior pipe surface.

4,630,651

APPARATUS FOR THE CONSTRAINED ACTUATION OF THE CLAMPING SYSTEM OF FILLING-YARN INSERTION DEVICES IN SHUTTLELESS WEAVING MACHINES

Florian Windischbauer, Lindau, Fed. Rep. of Germany, assignor to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

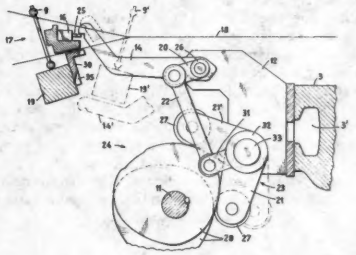
Continuation-in-part of Ser. No. 510,833, Jul. 5, 1983, Pat. No. 4,515,185. This application Feb. 5, 1985, Ser. No. 698,396

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224708

The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.

Int. Cl.⁴ D03D *47/18*

U.S. Cl. 139—446 **10 Claims**



1. In an apparatus employed in a shuttleless weaving machine wherein filling-yarn is inserted by gripper systems which are bilaterally advanced into the shed and then retracted and which are provided with clamping means for the filling-yarn, for constrained actuation of the clamping means by control levers controlled by cam means and entering through the warp threads of the shed from the exterior, the improvement which comprises:

pivot means defining a pivot axis for pivotably mounting said control levers at a fixed location below a path of travel of a fabric being woven in the weaving machine;

a control shaft extending beneath said path of travel of said fabric and substantially parallel to said pivot axis;

said cam means comprising at least one mutually complementary cam wheel pair mounted on said control shaft in driven relationship thereto;

actuation means comprising at least one double-lever rocker arm, sensing rolls cooperating therewith for operatively

following said cam means, and rocking means defining a rocking axis extending substantially parallel to said control shaft for pivotably mounting said at least one double-lever rocker arm;

said cam means and said actuating means conjointly defining a constrained-control cam system; and

linkage means operatively connecting said control levers with said actuation means for pivoting said control levers out of an operative position entering said shed into an idle position beneath a path of motion of a reed stay of a reed of the weaving machine.

4,630,652

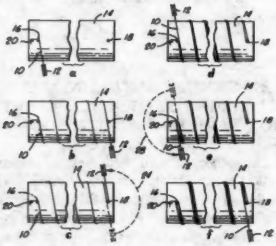
METHOD FOR FORMING A FLAT BAND OF PARALLEL, CONTIGUOUS STRANDS

Frank L. Dieterich, 5113 Miembro, Laguna Hills, Calif. 92653

Filed Jul. 1, 1985, Ser. No. 749,988

Int. Cl.[4] B21F *3/04*

U.S. Cl. 140—92.1 **6 Claims**



1. A method of forming a flat band of parallel, contiguous strands, comprising steps of:

winding a single strand in a first direction around a mandrel, to form a single-strand helical winding having a substantially constant pitch;

winding the single strand in a second, opposite direction around the mandrel, contiguous with the previous single-strand helical winding, to form a double-strand helical winding;

repeating the first and second winding steps in an alternating fashion until a multi-strand helical winding having a predetermined plurality of parallel, contiguous strands has been wound, each successive winding being contiguous with the second previous winding; and

removing the multi-strand helical winding from the mandrel to produce a flat band of parallel, contiguous strands.

4,630,653

WASTE TONER COLLECTING APPARATUS

Yuji Kan, Hyogo, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Jan. 23, 1985, Ser. No. 693,868

Claims priority, application Japan, May 17, 1984, 59-72682[U]

Int. Cl.[4] B65B *1/04*

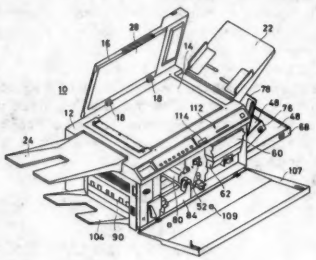
U.S. Cl. 141—83 **11 Claims**

1. A waste toner collecting apparatus for use in an image forming machine, the image forming machine using a toner for forming an image and having photosensitive means and a toner cleaning apparatus for removing waste toner from the photosensitive means, the waste toner collecting apparatus comprising:

a waste toner container for collecting waste toner;

means defining a passageway adapted to pass waste toner therethrough, the passageway defining means including an elongated, hollow inner tube, the inner tube having opposite ends, a first opening formed near one of its ends and a second opening formed near the other of its ends, the first opening being in communication with the waste toner cleaning apparatus and the second opening being selectively in communication with the toner container; and

a hollow outer tube at least partially surrounding at least a portion of the inner tube, the outer tube being adapted to rotate circumferentially about the inner tube between a first position and a second position, the outer tube including a third opening formed therein and situated to be



selectively in alignment with the second opening to allow waste toner to flow therethrough and into the waste toner container, wherein the second and third openings are in alignment and the second opening communicates with the toner container when the outer tube is in the first position, and wherein the second and third openings are in non-alignment and the second opening is not in communication with the toner container when the outer tube is in the second position.

4,630,654

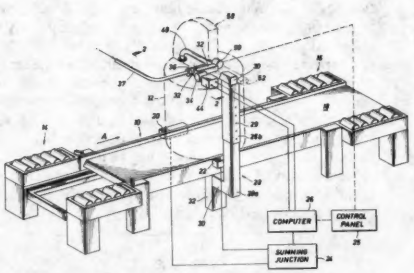
APPARATUS FOR LIQUID FILLING OF CONTAINERS

Conrad P. Kennedy, Jr., Beaumont, Tex., assignor to Patrick Howard Gibson, Sweeney, Tex.

Filed Aug. 10, 1984, Ser. No. 640,003

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—83 **15 Claims**



1. An apparatus for filling a container to a predetermined weight with a liquid from a liquid source while generating a minimum amount of foam comprising:

scale means operational to generate a control signal based on the weight of said liquid within said container and a control equation;

control valve means in flow controlling relationship between said liquid source and said container, said valve means having a movable valve element permitting selectively a calculated variable flow rate therethrough;

actuator means operatively associated with said control

valve for moving said valve element to vary said flow rate;

valve positioner means operatively associated with said actuator means to control operation of said actuator means in response to a calculated positioning signal;

an interface arrangement operatively associated with said scale means and said positioner to generate said positioning signal, said positioning signal being a calculated signal which is a formation of said control signal and a control program;

a conduit assembly for introducing said liquid into said container from said liquid source through said valve means and including a filling lance having a first run portion interconnected to a second run portion, said first run portion and said second run portion being angularly disposed with respect to one another, said filling lance being mounted for pivotal movement about a generally horizontal axis transverse to and extending generally through the end of said first run portion distal said second run portion; said second run portion having a free end distal said first run portion and a discharge opening generally transverse to the axis of said second run portion and away from said first run portion whereby said filling lance can be moved to a position such that said liquid is discharged through said discharge opening in a generally downward and outward path toward a side of said container; and

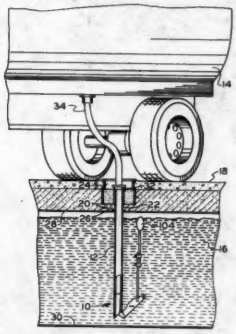
means for pivoting said lance between filling and non-filling positions.

4,630,655

STORAGE TANK FLOW CONTROL VALVE ASSEMBLY

Donald W. Fleischer, Wethersfield, and Bruno S. Smilgys, Hartford, both of Conn., assignors to Veeder Industries, Inc., Hartford, Conn.

Filed Oct. 24, 1985, Ser. No. 791,056
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—198 **15 Claims**



1. In combination,

an underground fuel storage system comprising a fuel storage tank positioned below ground level and a fill pipe assembly extending from ground level into said tank for refilling said tank from a gravity feed tanker truck, said fill pipe assembly including a fill tube extending into said tank and having a discharge end within said tank, and

a passive flow control valve assembly for controlling the flow of fuel through said fill pipe into said tank comprising

a valve housing mounted to the discharge end of said fill pipe and having an upstream end and a downstream end,

valve means pivotally mounted within said housing for controlling flow through said housing, said valve means having pivotally opposing sections and being pivotally moveable between a first open position permitting substantially unrestricted flow through said housing between said upstream and downstream ends and at least a second position substantially restricting flow through said housing between said upstream and downstream ends,

actuator arm means for moving said valve means between said first and second positions, said actuator arm means being mounted for movement between first and second positions and being interconnected to said valve means so as to correspondingly move said valve means from said first position to said second position as said actuator arm means moves from said first position to said second position, wherein said valve means is releasably pivotally moveable from said second position in the direction of said first position to permit less restricted flow through said housing between said upstream and downstream ends than the corresponding flow at said second position upon application of a suitable force to a said valve means section in a direction generally toward said downstream end, and

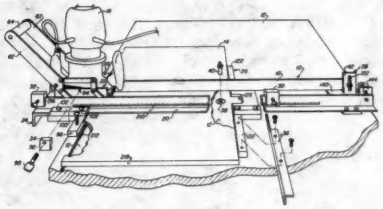
float means connected to said actuator arm means for moving said arm means to said second position when the liquid level of the storage tank reaches a predetermined level.

4,630,656

ROUTER ATTACHMENT

J. W. Collins, 412 Bristle Cone La., Naples, Fla. 33962

Filed Jun. 10, 1985, Ser. No. 743,022
Int. Cl.[4] B27C *5/10*
U.S. Cl. 144—134 D **20 Claims**



19. A router attachment attachable to a work table for controlling the operation on a workpiece of a router having a router bit extending therefrom, said workpiece resting on said table, said attachment comprising:

a pair of angle support members;

means for maintaining said support members parallel to one another at a desired distance above said table, said desired distance being greater than the thickness of said workpiece;

carriage means for holding a router and adapted for moving between said support members, said carriage means having a bottom and two sides vertical to said bottom, said sides having outer surfaces parallel to one another and separated by said desired distance;

means for raising and lowering said carriage means between a first position at which said bottom rests on said workpiece and a second position at which said router bit is above said workpiece;

means coupled below said support members for holding said workpiece; and

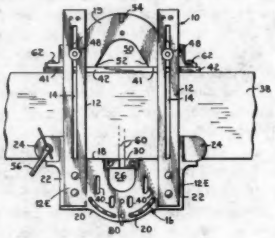
stop means for defining the limits of movement of said carriage means.

4,630,657

VERSATILE ROUTER GUIDE APPARATUS

George Obradovich, 812 Kennedy Ave., Schererville, Ind. 46375

Filed May 28, 1985, Ser. No. 738,444
Int. Cl.[4] B27C 5/10
U.S. Cl. 144—144.5 GT 14 Claims



1. A guide apparatus for a router that is portable and easily moved and adjusted to fit and used with different sized workpieces, comprising:

a pair of side rail members;

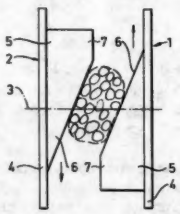
means attachable to each of said rail members spanning between them so as to secure them in a parallel but spaced apart relationship, spaced at a separation that receives, in a guiding fit, the base of the router, and for releasably coupling the apparatus to a workpiece so that the router may be guided thereon without the need for any attachment of the guide apparatus nor the router to any other support, with said means and side rail members being attachable in different positions so as to accommodate the apparatus to differing sized workpieces or differing cuts therein.

4,630,658

COUNTER ROTATING DOUBLE DISC CHUNKER

Rodger A. Arola, Hancock, Mich., and Hans-Olof Säll, Hedemora, Sweden, assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 16, 1985, Ser. No. 734,527
Int. Cl.[4] B27L 11/02
U.S. Cl. 144—176 14 Claims



1. A device for cutting wood materials such as roundwood, treetops, branches and waste wood into pieces of such wood materials of predetermined substantially uniform lengths of such materials suitable for combustion comprising

a pair of opposed disc members;

means to mount said disc members to that their circular faces are in facing relation to each other;

means to feed the wood materials to be cut into the space between said pair of facing opposed disc members;

means to rotate said disc members in opposite directions;

knife means mounted on each of said disc members on the respective facing circular faces thereof; each of said knife means comprising a first cutting edge and a second cutting edge, said second cutting edge being located in a plane parallel to the plane of rotation of its respective member, said first cutting edge extending in the direction of rotation of its respective disc member from the end of said second cutting edge which leads in the direction of rotation of its respective disc member at a slant to said circular face of said respective disc member, the planes containing the second cutting edges of said knife means on said pair of disc members being located in the space between said facing circular faces of said disc members; and means to locate said disc members with respect to each other such that said second cutting edges pass each other in the same predetermined closely spaced relation during each rotation of said disc members in said opposite directions;

said knife means alone performing all of the cutting of said wood materials; and

said oppositely rotating knife means tending to rotate said wood materials about a line of wood material feed defined by said feed means;

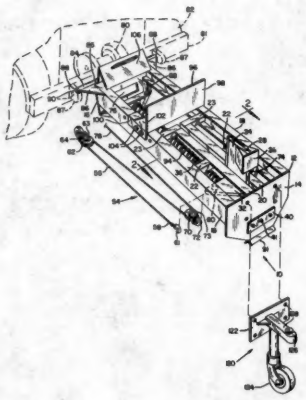
whereby wood materials fed longitudinally between said knife means are cut by said knife means into said lengths rather than being chipped or crushed or otherwise finely divided, and whereby cutting of said wood materials proceeds continuously.

4,630,659

WINCH-POWERED WOOD SPLITTER

Joel W. Warthen, P.O. Box 105, Kellogg, Id. 83837

Filed Apr. 26, 1985, Ser. No. 727,728
Int. Cl.[4] B27L 7/00
U.S. Cl. 144—193 R 8 Claims



8. A wood splitting device comprising:

a support frame attachable to the bumper of a motor vehicle;

a movable blade adapted for reciprocating motion along said support frame, said blade having upper and lower portions and a leading edge positioned to face a log or other wooden workpiece during splitting;

a splitting wedge fixedly secured to said upper portion of said blade;

a cable attachment member fixedly secured to said lower portion of said blade;

a blade carriage sleeve fixedly secured to said lower portion of said blade;

blade guide means positioned within said support frame for controlling the path of said blade, said guide means comprising two parallel elongate guide rails fixedly attached within said support frame, said elongate guide rails being positioned to allow passage of said blade therebetween;

a blade carriage shaft fixedly positioned within said support frame, said sleeve being slidably movable on and along said blade carriage shaft;

a blade return spring extending along said blade carriage shaft from said leading edge of said blade;

an abutment member mounted on said support frame to limit the movement of said workpiece during splitting;

a drive transmission comprising first and second snatchblocks to guide a drive cable which is securable to said cable attachment member on said blade so that said cable extends away from said attachment member toward and through said first snatchblock which is secured to said support frame, from which said cable extends away from said snatchblock toward and through said second snatchblock which is secured to said attachment member on said blade, from which said cable extends away from said second snatchblock to a winch mounted on said motor vehicle, whereby when said winch exerts pulling force on said cable, said blade is pulled along and through said blade guide means toward and into said workpiece, during which said blade carriage sleeve moves along said blade carriage shaft compressing said blade return spring until splitting of said workpiece is accomplished, and whereby, when said cable is subsequently slacked, said blade return spring pushes said blade carriage sleeve and attached blade away from said log or wooden workpiece.

4,630,660

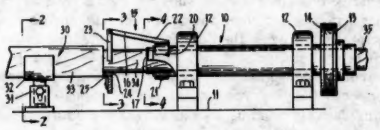
DOWELL MAKING

William J. McGuire, 13 Albert Rd., Moonah, Tasmania 7009, Australia

Filed Jun. 25, 1985, Ser. No. 748,468

Int. Cl.[4] B27B *1/00*

U.S. Cl. 144—363 **11 Claims**



1. A dowell making machine having a central hollow rotatable shaft, a driving means and means for connecting the shaft to the driving means, an end plate located co-axial with the shaft and rotatable therewith, the end plate having a central aperture co-axial with the aperture of the shaft, the aperture being larger in diameter than the dowell to be made and having cutting blades thereabout, a cylindrical saw blade associated with the tool and being co-axial with the axis of the aperture of the shaft, and between the end plate and the shaft, the arrangement being such that timber passing through the end plate is first formed to a substantially cylindrical shape and on passing through the cylindrical olade is sized to form a dowell.

9. A method of making a dowell using a dowell making machine having a central hollow rotatable shaft adapted for rotation by connection to a driving means, and having an end plate located co-axial with the shaft and adapted to be located for rotation therewith, the end plate having a central aperture co-axial with the aperture of the shaft, the aperture being larger in diameter than the dowell to be made and having cutting blades thereabout, and having a cylindrical saw blade associated with the tool and being co-axial with the axis of the aperture of the shaft, and between the end plate and the shaft, the arrangement is such that the timber passing through the end plate is first formed into a cylindrical shape and on passing through the cylindrical blade is sized to form a dowell, comprising the step of passing the stock from which the dowell is to be made through the machine.

4,630,661

PNEUMATIC VEHICLE TIRE TREAD, ESPECIALLY RADIAL-PLY TIRE FOR TRUCKS

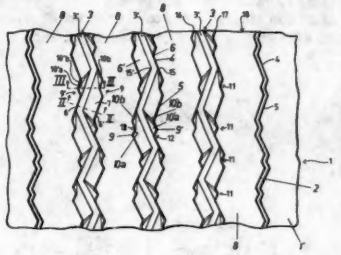
Josef Stelzer, Vienna, Austria, assignor to Semperit Reifen AG, Vienna, Austria

Filed Dec. 10, 1984, Ser. No. 680,186

Claims priority, application Austria, Dec. 23, 1983, 4505/83

Int. Cl.[4] B60C *11/06*

U.S. Cl. 152—209 R **14 Claims**



1. A pneumatic vehicle tire, especially a radial-ply truck tire, comprising:

a tread defining a circumferential direction;

a predetermined number of ribs formed in said tread and extending in said circumferential direction thereof;

a predetermined number of zig-zag-shaped grooves separating said ribs from each other;

each one of said predetermined number of zig-zag-shaped grooves defining a base and having a cross-section which decreases towards said base;

each one of said predetermined number of zig-zag-shaped grooves being bounded by two opposite sidewalls and defining angled regions;

each one of said predetermined number of zig-zag-shaped grooves, when viewed in cross-section and between said angled regions, being bounded by a first sidewall section which extends at least approximately normally to said tread, and a second sidewall section located opposite said first sidewall section and constituting a dually-angled sidewall section;

each one of said predetermined number of zig-zag-shaped grooves comprising circumferentially consecutive groove sections;

said first sidewall sections and said second sidewall sections being disposed on alternating sides of each one of said grooves in said circumferentially consective groove sections of each one of said grooves;

each said angled region in each one of said predeterminded number of zig-zag-shaped grooves comprising a salient angled region and a reentrant angled region confronting said salient angled region across each one of said grooves; and

each one of said predetermined number of zig-zag-shaped grooves comprising a recessed corner region formed in each said salient angled region and a protuberant corner region formed in each said reentrant angled region.

4,630,662

VEHICLE WHEEL WITH TIRE BEAD CLAMPING RING

Volker Howind, Wedemark, Fed. Rep. of Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Mar. 19, 1985, Ser. No. 713,771

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1984, 3410048

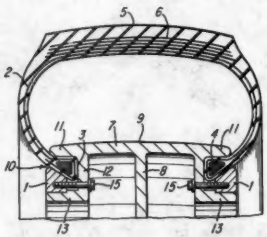
Int. Cl.[4] B60B *21/00, 21/10*

U.S. Cl. 152—397 **10 Claims**

1. A vehicle wheel, especialy for trucks and other heavy

vehicles as well as being suitable for so-called emergency running operation, having an axis of rotation and a rigid rim on which can be mounted a pneumatic tire of rubber or rubber-like material including tire beads drawn spontaneously into a sealing position during inflating of the tire as well as being also automatically centered thereby relative to said rim as dual effects attained therewith; the carcass of the tire is anchored in the tire beads by being looped around pull-resistant bead cores, and the tire beads are disposed on the radially inner periphery of the rim ring; said wheel comprises:

a central rim ring portion, to both sides of which extend respective axially outer rim ring parts, each of said rim



ring parts forming a seating surface for a tire bead, each of said seating surfaces extending essentially parallel to said axis of rotation of said wheel;

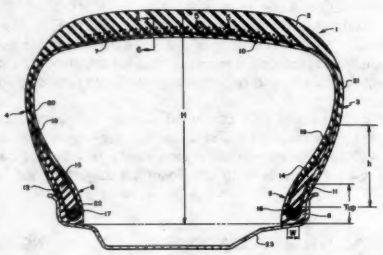
a respective clamping ring disposed radially inwardly of each of said tire beads, said clamping ring having a side including a surface which rests at an acute angle against its tire bead, said side surface extending at an acute angle to said axis of rotation of said wheel; each of said bead cores having a cross-sectional shape which includes a side which is essentially parallel to said side surface of said clamping ring, and a side which is essentially parallel to said seating surface for its bead.

4,630,663

TIRE CONSTRUCTION UTILIZING LOW-TWIST BODY PLY YARN WITH LOW TURN-UP ENDS

Thomas W. Bell, Mogadore, and Louis W. Shurman, Canton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 27, 1984, Ser. No. 675,164
Int. Cl.[4] B60C *15/06*
U.S. Cl. 152—541 **9 Claims**



1. An improved pneumatic tire of the type having a tread portion, a pair of side wall portions, a pair of bead portions located below the side wall portions which include an annular bead core and a generally triangular-shaped bead filler, and a body ply structure extending circumferentially about the tire and being turned-up around the bead portions from the inside to the outside and terminating in a pair of turn-up end portions adjacent the bead filler, said improvement being characterized by:

(a) the body ply being formed of a low twist yarn having between 3 and 6 turns-per-inch;

(b) the turn-up end portions extending along the side wall portions a distance of between 10% and 30% of the tire section height;

(c) the bead filler consisting of a high hardness rubber having a Shore A hardness of between 75 and 98, a height of between 20% and 50% of the tire section height, and a maximum base width of between 15% and 35% of the bead filler height; and

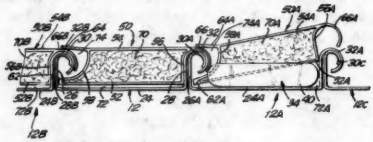
(d) said side wall portions between the tread portion and bead portion being free of any additional textile or metal reinforcement except that provided by the body ply structure.

4,630,664

INSULATED ROLL-UP DOOR

Sebastian Magro, 78-47 75th St., Glendale, N.Y. 11385

Filed Mar. 28, 1984, Ser. No. 594,296
Int. Cl.[4] E06B *9/10*
U.S. Cl. 160—232 **11 Claims**



1. A roll-up door comprising:

a plurality of elongated adjoining slats;

hinge means for coupling said adjoining slats together for relative movement of said slats between a vertical co-planar arrangement when the door is closed, and an arcuate arrangement when the door is being rolled up;

each of said slats including a U-shaped elongated channel having a web portion interconnecting inwardly directed opposed flange portions, said web portions of said slats cumulatively defining a front face of the door;

distal ends of said opposed flange portions of each slat terminating in forwardly directed arcuately curved first and second segments to define said hinge means;

said first segment on each slat having a curvature substantially concentric with and smaller than a curvature of said second segment on each respective slat;

said smaller first segment defining an elongated hinge pin for insertion into a hinge barrel of an adjoining slat on one side thereof;

said larger second segment defining an elongated hinge barrel for receiving a hinge pin of an adjoining slat on an opposite side thereof; and

insertable and removable elongated insulation members being co-extensively disposed along each slat with each insulation member being positioned between said opposed flange portions of each respective slat;

each of said insulation members having a thickness from front to rear thereof less than depth of each of said U-shaped slat channels correspondingly from front to rear thereof so that said front of each of said insulation members is in a rearwardly spaced apart relationship to said web portion of each of said slats;

first and second support means on opposing sides of each of said insulation members for suspending each of said insulation members in said rearwardly spaced apart relationship to each of said slat web portions to provide an air space therebetween for additional insulation, said air space extending from one flange portion of each of said slats to the other flange portion of each of said slats;

said first support means including an elongated arcuate hook

extending from a rear edge on one side of said insulation member for latching around an exterior of said elongated hinge barrel on each respective slat;

said second support means including an elongated lip resiliently projecting from said rear edge on the opposite side of said insulation member;

said elongated lip being in continuous engagement on an elongated hook of an adjoining insulation member for suspending said insulation member above said slat web portion of its respective slat;

said elongated hook of each insulation member securing and suspending said insulation member relative to its respective slat;

foot means for wedging against said one flange portion beneath said elongated hinge pin on each respective slat to retain said insulation members in its suspended position along said respective slats;

said foot means including an elongated foot projecting from a front edge on said opposite side of each insulation member;

said opposite side of each insulation member being provided with recess means between said lip and said foot for accommodating said elongated hinge barrel and elongated hook of its associated adjoining slat; and

said recess means including an arcuate recess having a curvature extending from said foot to be concentric with an arc of rotation of said adjoining slats.

4,630,665

BONDING ALUMINUM TO REFRACTORY MATERIALS

John W. Novak, Jr., New Kensington; Dennis R. Raines, Holiday Park, and Donald J. Bray, Murrysville, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 26, 1985, Ser. No. 769,132
Int. Cl.[4] B22D *19/14*
U.S. Cl. 164—97 17 Claims

1. A method of bonding aluminum and aluminum alloys to a refractory material, comprising

(a) heating a body of aluminum or an aluminum alloy to a temperature of about 1100°–1500° C.,

(b) controlling total pressure adjacent the heated body above the vapor pressure of aluminum but less than about 1,000 microns Hg,

(c) maintaining the partial pressure of oxygen adjacent the heated body sufficiently low to prevent substantial oxidation of the body, the contact angle between the heated body and refractory material being less than about 45°, and

(d) contacting the heated body with a mass comprising a refractory material.

12. A method of forming a composite comprising a metal matrix reinforced by fibers of a refractory material without application of a pressure differential, said method comprising

(a) providing a mold defining a mold cavity containing a mass of fibers of a refractory material, said fibers forming a network defining a plurality of interstices,

(b) heating a body of aluminum or an aluminum alloy to a temperature of about 1200°–1500° C.,

(c) introducing the heated body into the mold cavity so that the body contacts the mass of fibers, while controlling total pressure adjacent the heated body above the vapor pressure of aluminum but less than about 1,000 microns Hg and maintaining the partial pressure of oxygen adjacent the heated body sufficiently low to prevent substantial oxidation, said heated body thereby being drawn by capillarity into the interstices of said mass, and

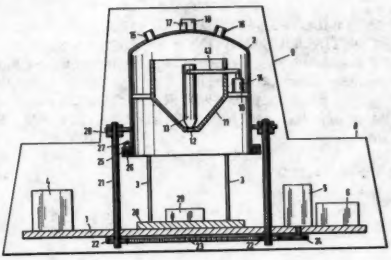
(d) cooling said body and said refractory material, thereby to form a composite comprising a matrix of aluminum or aluminum alloy reinforced by a network of refractory fibers.

4,630,666

CASTING DEVICE FOR DENTAL CASTS

Horst Wismann, Gartenstr. 22, D-8162 Schliersee, Fed. Rep. of Germany

Continuation of Ser. No. 495,432, May 17, 1983, abandoned. This application Oct. 1, 1985, Ser. No. 782,155
Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3219008
Int. Cl.[4] A61C *13/20*; B22D *18/00*
U.S. Cl. 164—155 12 Claims



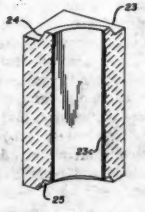
1. A casting device for making dental casts with low melting metals or alloys comprising a casting chamber in the form of a bell having a rim and an external surface, means for sealing the casting chamber in a pressure-tight manner including a plate, said bell being liftable and lowerable relative to said plate by lifting means and having connection means for connection to a source of pressure and to vacuum means, said means for sealing further including a fluid pressure actuated sealing member disposed on said external surface of said bell and adjacent and surrounding said rim so that said sealing member will seal against both said rim and said plate when said bell is lowered to engage said plate and said sealing member is actuated, a melting crucible mounted in said bell and being movable with said bell, said bell being provided with a filling hole for material to be melted, said crucible having a discharge opening and a casting valve means mounted in said crucible for movement toward said discharge opening to close said opening and away from said opening by means of a solenoid mounted in said bell, an agitator disposed in said crucible, driving means mounted in said bell for driving said agitator, said casting device further including means for automatically controlling the operation of said device.

4,630,667

COATED REFRACTORY SHAPES USEFUL IN BOTTOM POURING OF INGOTS IN INGOT MOLDS

Michael D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Jul. 17, 1985, Ser. No. 755,734
Int. Cl.[4] B22C *9/08*
U.S. Cl. 164—363 5 Claims



2. In an ingot mold assembly for the bottom pouring of

molten metal into said ingot mold having a plurality of connecting horizontally disposed hollow tiles communicating with said ingot mold and a plurality of connecting vertically disposed hollow tiles communicating with said horizontally disposed hollow tiles; the improvement comprising said hollow tiles being formed of refractory material and a penetrating heat insulating lining in the interior of said hollow tiles for controlling heat transfer from molten metal therein to said refractory material whereby thermal shock and resultant cracking and spalling of said refractory material is controlled.

4,630,668

INTEGRAL CASTING APPARATUS FOR USE IN CONTINUOUS CASTING OF MOLTEN METAL

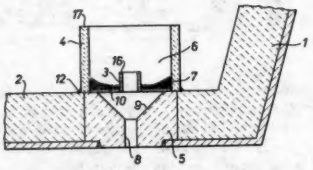
Rolf Waltenspühl, Zug, Switzerland, assignor to Stoping Aktiengesellschaft, Baar, Switzerland

Filed May 20, 1985, Ser. No. 736,122

Claims priority, application Switzerland, May 23, 1984, 2532/84

Int. Cl.[4] B22D *11/10*

U.S. Cl. 164—437 **22 Claims**



11. An apparatus, for use with a metallurgical vessel for the continuous casting of molten metal through a discharge opening in a bottom thereof, for preventing solidification of the molten metal in the discharge opening at the beginning of a casting operation, said apparatus comprising:

a first overflow pipe adapted to be mounted above the discharge opening to extend above the bottom of the vessel; and

a second overflow pipe mounted about said first overflow pipe and defining therewith an annular recess;

whereby molten metal to be cast from the vessel is adapted to first overflow the upper edge of said second overflow pipe into said annular recess and then to overflow the upper edge of said first overflow pipe to be discharged through the discharge opening of the vessel.

4,630,669

HEAT EXCHANGE APPARATUS FOR HIGH TEMPERATURE LPCVD EQUIPMENT

Peter H. Kessler; Wilson D. Calvert, Sr., both of Round Rock, and Faivel S. Pintchovski, Austin, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 15, 1985, Ser. No. 765,640

Int. Cl.[4] F28F *3/12*

U.S. Cl. 165—1 **4 Claims**

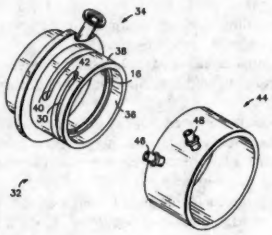
4. A method for cooling and preserving the O-rings sealing a heat exchange assembly between a quartz reactor tube and a heat exchanger end cap, comprising the steps of:

conducting a LPCVD reaction inside the quartz reactor tube at a temperature in the range of 800° to 900° C.; and

circulating a heat exchange fluid through a sinuous fluid channel of an end cap comprising:

a base sleeve having a first surface having the sinuous fluid channel formed therein extending between an inlet portion and an outlet portion, and a second surface having at least one O-ring for sealing tightly against the quartz reactor tube, and wherein the sinuous fluid channel is positioned along the first surface such that the channel is positioned oppositely, in close proximity of and adjacent to the O-ring in the second surface to withdraw heat therefrom; and

a cover sleeve having at least a first surface of substantially the same cross-section as that of the first surface of the base sleeve so as to substantially seal the fluid channel in an operative position of the sleeves, the cover



sleeve having an inlet port and an outlet port extending therethrough so as to align with the inlet and outlet portions, respectively, of the fluid channel in the operative position of the sleeves; and

drawing heat from the quartz reactor tube past the O-rings positioned between the quartz reactor tube and the end cap and transferring it to the heat exchange fluid.

4,630,670

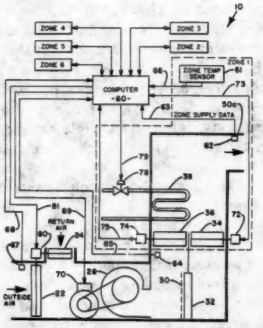
VARIABLE VOLUME MULTIZONE SYSTEM

Donald C. Wellman, Marcellus, and William E. Clark, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 562,912, Dec. 19, 1983, Pat. No. 4,549,601, which is a continuation-in-part of Ser. No. 390,606, Jun. 21, 1982, Pat. No. 4,495,986. This application Jun. 17, 1985, Ser. No. 745,041

Int. Cl.[4] F25B *29/00*

U.S. Cl. 165—16 **8 Claims**



5. A variable volume multizone system for simultaneously supplying warm, cool and neutral air, as required, to a plurality of zones from a common source comprising;

variable volume air supply means for supplying air in required amounts;

air cooling means;

a variable multizone section divided into a plurality of units corresponding to the number of zones;

each of said units having a first inlet controlled by a first damper means for supplying cool air to a zone, a second inlet controlled by a second damper means for supplying neutral or heated air to a zone and heating means for heating air passing through said second damper means;

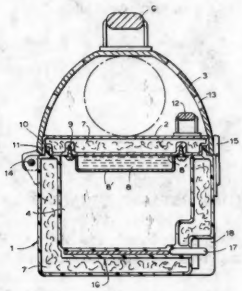
means for sensing the temperature in each zone;

means for sensing the amount of air supplied to each zone;
means for controlling said first and second damper means in each zone responsive to the sensed temperature and amount of air supplied to the zone.

4,630,671
LUNCH BOX

Victor Sherman, 13-10 34 Ave., Long Island City, N.Y. 11121, and Ilya Zborovsky, 3285 Wolfson Dr., Baldwin, N.Y. 11510

Filed Feb. 12, 1985, Ser. No. 700,962
Int. Cl.[4] F25B *29/00*
U.S. Cl. 165—61 **1 Claim**



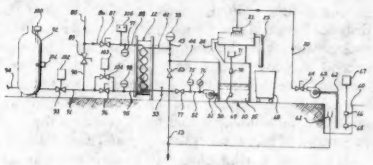
1. A lunch box, comprising
a hollow body bounding an inner substantially closed chamber for accommodating food;
a hollow vessel removably attached to a part of said body so as to be located in said inner chamber when it is attached, and filled with a liquid which can be frozen and thereby cools said inner chamber; and
an electrical heating element connected with said hollow body and connectable with an electric power source so as to be heated and to supply heat into said inner chamber for accommodating food contained in said inner chamber for accommodating food, and disconnectable from an electric power source so as to be deactuated for cooling said inner chamber by said liquid-filled vessel,
said liquid-filled vessel being mounted in said inner chamber so as to be movable between a first position in which it faces toward said inner chamber for cooling the latter, and a second position in which it faces away of said inner chamber and therefore said heating element so that when said heating element heats said inner chamber said vessel is less subjected to the action of heat from said heating element.

4,630,672
ON LINE SCRUBBING SYSTEM FOR PLATE AND FRAME HEAT EXCHANGERS

Richard O. Kaufmann, 6050 El Camino del Cerro, Tucson, Ariz. 85705

Continuation of Ser. No. 390,848, Jun. 22, 1982, abandoned, which is a continuation of Ser. No. 101,719, Dec. 10, 1979, abandoned, and a continuation of Ser. No. 873,252, Jan. 30, 1978, abandoned. This application Jul. 12, 1984, Ser. No. 630,021
Int. Cl.[4] F28G *1/16*
U.S. Cl. 165—95 **1 Claim**

1. An on line recovery system for use in a commercial laundry and the like comprising:
a. a sump for receiving a laundry's heated waste water;
b. separating means connected to said sump for receiving said waste water and separating particulate therefrom;
c. a flat plate heat exchanger having interstices between adjacent plates of sufficiently small size as to be subject to clogging by contaminates passing said separating means connected to receive pressurized heated waste water from said separating means for cooling said waste water and connected to a source of fresh water to be heated for use in said laundry;
d. an injection means for injecting air into said heated waste water, said injection means positioned to inject air into

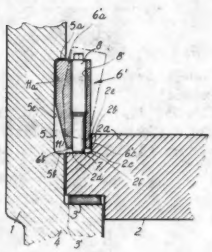


said heated waste water before said waste water enters said heat exchanger to create bubbles of air permeating said waste water as said waste water flows through said heat exchanger; and
e. means connected to said heat exchanger for directing heated fresh water exiting therefrom to said laundry and means connected to said heat exchanger for disposing of cooled waste water exiting therefrom.

4,630,673
CLAMPING ASSEMBLY HEAT EXCHANGER TUBE PLATES

Riccardo Belleli, Mantova, Italy, assignor to Belleli S.p.A., Mantova, Italy

Filed Jun. 14, 1983, Ser. No. 504,344
Claims priority, application Italy, Jun. 21, 1982, 21968 A/82; Oct. 15, 1982, 23204/82[U]; Oct. 22, 1982, 23890 A/82; Mar. 15, 1983, 21112/83[U]
Int. Cl.[4] F28F *9/06*; F28D *1/06*; F16L *39/00*
U.S. Cl. 165—158 **1 Claim**



1. In an annular heat exchanger having a a longitudinal and a radial extent including a header chamber portion extending from a shell portion of the heat exchanger and having an annular seating surface means and a tube plate having a shell side facing the shell portion and a head side facing the header chamber portion of the heat exchanger and resting with said shell side thereof onto said seating surface means,
a clamping assembly structure comprising a circumferential groove in said header chamber portion, at a distance from said seating surface means and coaxial therewith, said groove defining a first upper shoulder means near said head side of the tube plate and a second opposite shoulder means longitudinally at a distance from said head side of the tube plate and an outwardly recessed circumferential longitudinally extending cylindrical bottom surface of said groove and connecting said first and said second shoulders,

in said tube plate at said head side thereof a circumferential step formation facing said groove, said step formation having a flange surface and a longitudinally extending riser surface transverse thereto and having a circumferential top edge, said flange surface and said riser surface being inwardly

offset with respect to said first and second shoulder means, a segmented ring comprising annular segment elements with a top surface and a base surface, each said element having a longitudinal extension which is less than the distance between said first and said second shoulder means and greater than the longitudinal distance between said second shoulder means and said top edge of said riser surface thereby to leave a gap between said base surface and said flange surface and having a diametral extension which is substantially equal to the sum of the diametral extensions of said second shoulder and said flange surface, said segmented ring elements having each an external longitudinally extending first mating surface portion in mating engagement with at least part of said bottom surface of said groove, said segmented ring elements having each a longitudinally extending internal second mating surface portion in mating engagement with at least part of said riser surface and inwardly offset with respect to said external first mating surface, said segmented ring elements having each a radially extending third mating surface portion extending transverse to said first and said second mating surface portions and in mating engagement with said second shoulder means and, wherein said segmented ring elements have each a tapering region at the outward surface thereof, tapering from said first mating surface portion towards said base surface thereof thereby to allow insertion by a tilting movement of said segmented ring elements into the space between said step formation and said circumferential groove,

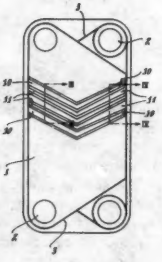
pressing means within said segmented ring elements, said pressing means having one end portion thereof projecting towards said flange surface of said step formation beyond said segmented ring element thereof and in pressing engagement with said flange surface, thereby to clamp said tube plate against said seating surface means.

4,630,674

PLATE HEAT EXCHANGER

Malte Skoog, Tumba, Sweden, assignor to Malte Skoog Invent Ab, Lund, Sweden

Filed Jan. 11, 1980, Ser. No. 111,472
Claims priority, application Sweden, Jan. 17, 1979, 7900410-7
Int. Cl.[4] F28F *13/08, 3/04*
U.S. Cl. 165—147 **8 Claims**



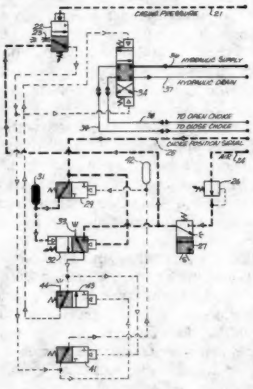
1. A plate heat exchanger comprising a plurality of generally rectangular plates stacked together to define between them passages for two heat exchanging fluids, the plates having openings at the corner regions thereof for conveying said fluids to and from respective passages, each plate having inlet and outlet openings for one fluid located adjacent one side edge of the plate and having inlet and outlet openings for the other fluid located adjacent the opposite side edge of the plate, the plates having corrugations defining alternate ridges and grooves which extend across the plates to increase turbulence of the heat exchanging fluids in the passages, the cross-section of each corrugation groove increasing along the length of the groove in such a direction that the volume per unit width of each passage changes across the width of the two plates defining said passage, said volume per unit width of each passage being relatively small adjacent those side edges of said two plates which are nearer said inlet and outlet openings through which fluid is conducted to and from said passage, said volume per unit width of each passage being relatively larger adjacent the opposite side edges of said two plates.

4,630,675

DRILLING CHOKE PRESSURE LIMITING CONTROL SYSTEM

Lawrence E. Neipling, Long Beach, and Mark C. Flohr, Irvine, both of Calif., assignors to Smith International Inc., Newport Beach, Calif.

Filed May 28, 1985, Ser. No. 737,942
Int. Cl.[4] E21B *7/00*
U.S. Cl. 166—53 **8 Claims**



1. A pneumatic pressure limiting system for a hydraulically actuated drilling choke having a pneumatic pressure signal indicative of the choke position comprising:

means responsive to casing pressure for selectively activating the pressure limiting system by applying pneumatic pressure when the casing pressure exceeds a maximum allowable pressure;

a memory accumulator connected to the source of the pressure signal indicative of choke position;

a pilot controlled memory latching valve operable upon activation of the system for temporarily isolating the memory accumulator for storing the pressure signal indicative of choke position before activation of the pressure limiting system; and

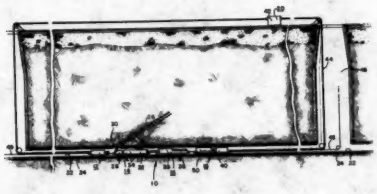
pneumatic accumulator means connected to the pilot operator of the memory latching valve for maintaining isolation of the memory accumulator until the casing pressure decreases below the maximum allowable pressure.

4,630,676

REMOTELY CONTROLLED HYDRAULIC CUTTER APPARATUS

Charles A. Long, Jr., Birmingham, Ala., assignor to Long Technologies, Inc., Birmingham, Ala.

Filed Dec. 23, 1983, Ser. No. 564,983
Int. Cl.[4] E03F 3/06
U.S. Cl. 166—55 10 Claims



1. A remotely controlled, hydraulically operated cutter apparatus for use within a conduit comprising:

control means located outside of the conduit for generating a plurality of electrical control signals for controlling the operation of the cutter apparatus;

a source of pressurized hydraulic fluid;

valve means for receiving both pressurized hydraulic fluid from the fluid source and control signals from the control means and for distributing the received hydraulic fluid in accordance with the received control signals;

a hydraulically powered cutter motor located within the conduit and including a cutting tool, said cutter motor receiving hydraulic fluid from the valve means for driving the cutting tool;

means for supporting the cutter motor within the conduit;

first hydraulically actuated means for receiving hydraulic fluid from the valve means and for holding the supporting means at a fixed axial position within the conduit as long as the received hydraulic fluid exceeds a predetermined minimum;

second hydraulically actuated means for receiving hydraulic fluid from the valve means and for adjusting the axial position of the cutter motor with respect to the supporting means in accordance with the received hydraulic fluid;

third hydraulically actuated means for receiving hydraulic fluid from the valve means and for adjusting the radial position of the cutter motor with respect to the supporting means in accordance with the received hydraulic fluid; and

fourth hydraulically actuated means for receiving hydraulic fluid from the valve means and for rotating the cutter motor up to 180 degrees about the axis of the conduit in either a clockwise or counterclockwise direction with respect to an initial position in accordance with the received hydraulic fluid, the first, second, third and fourth hydraulically actuated means cooperating to position the cutter motor to facilitate cutting by the cutting tool,

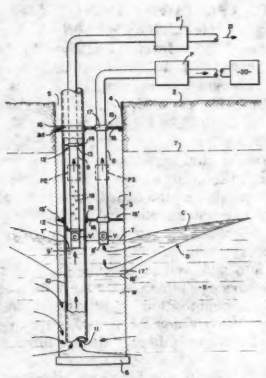
the valve means comprising manifold means including an inlet port for receiving the pressurized fluid from the fluid source, an outlet port for transmitting fluid to the fluid source and a plurality of at least nine fluid transfer ports for transmitting pressurized hydraulic fluid to and receiving return hydraulic fluid from the cutter motor and the first, second, third and fourth hydraulically actuated means, a plurality of at least nine electrically operated solenoid valves for selectively directing the hydraulic fluid between the manifold means inlet and outlet ports and the manifold means transfer ports in accordance with the received control signals, at least nine flexible hydraulic hoses, a first end of each hose being connected to one of the manifold means fluid transfer ports and the second end of each hose being connected to one of the cutter motor or the first, second, third or fourth hydraulically actuated means, and means for maintaining the nine hydraulic hoses in an untangled condition while facilitating the movement of one or more of the hydraulic hoses to accommodate for axial or radial adjustments in the position of the cutter motor and for the rotation of the cutter motor, the means for maintaining the nine hydraulic hoses comprising an elongated hydraulic hose control housing positioned within the conduit, the housing being generally U-shaped in cross section and including a pair of guide grooves extending generally parallel to the axis of the conduit and a slide member supported by the guide grooves for movement along the axis of the conduit with respect to the housing in correspondence with axial movement of the cutter motor, the hydraulic hoses having second ends which are connected to the cutter motor and the third and fourth hydraulically actuated means being six in number and being secured to said slide member for movement therewith, said six hydraulic hoses including expansion loops to permit axial movement of the six hydraulic hoses for a predetermined distance to compensate for axial movement of the cutter motor without substantial stressing or stretching of the six hoses.

4,630,677

FLUID RECOVERY SYSTEM

Paul G. Jakob, 7201 Venetian Way, West Palm Beach, Fla. 33406

Filed Jan. 7, 1986, Ser. No. 816,829
Int. Cl.[4] E21B 43/14
U.S. Cl. 166—68 12 Claims



1. A system for recovering a fluid product floating atop ground water comprising, a well having a well screen extending downwardly substantially below the static water and product level of the ground, a product withdrawal pipe and a water withdrawal pipe each provided with a bottom intake disposed within said well below said static level, an enlarged internal diameter separator tube surrounding said water withdrawal pipe and having a bottom opening disposed substantially below said water withdrawal pipe intake, said two pipes extending upwardly from said well to points adjacent grade level, a water and product pump respectively connected to said two pipes to separately withdraw water and product from said well respectively, said water pump operable to remove ground water from the lowest reaches of the well through said separator tube bottom opening and said water withdrawal pipe intake whereby, the static level of the ground water is lowered and forms an inverted cone of depression of ground water well below said pipe intakes with said product floating thereatop, said product accumulating as a central zone within said well and having a surface level normally no lower than said product

withdrawal pipe intake, and said product pump operable to remove said product from said central zone.

4,630,678

IN-SITU FORMATION OF POLYVALENT METAL IONS FOR CROSSLINKING POLYMERS WITHIN CARBONATE ROCK-CONTAINING RESERVOIRS

Naim A. Mumallah, Bartlesville, Okla.; Donald D. Bruning, Houston, Tex., and Riley B. Needham, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 3, 1985, Ser. No. 740,447
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—281 **14 Claims**

1. A method for treating a carbonate-containing underground formation wherein said carbonate comprises a calcium or calcium/magnesium carbonate which method comprises the sequential injection of

(A) effective permeability control proportions of an in-situ gelable composition comprising effective ratios of:

(a) water, and (b) at least one polymer capable of gelling with a crosslinking agent selected from calcium and magnesium irons within an acidic gelation pH range,

(B) an aqueous solution of a water-soluble acid in amounts sufficient to dissolve a portion of said carbonate, thereby liberating calcium or calcium and magnesium ions, and

(C) an aqueous solution of the polymer of (A), thereby gelling in-situ said polymer of steps (A) and (C) with said calcium or calcium and magnesium ions and effecting permeability contrast correction.

4,630,679

METHOD FOR TREATMENT AND/OR WORKOVER OF INJECTION WELLS

Henry C. Reeves, III, Layfayette, La.; Gary F. Potter, Tulsa, Okla., and Suzanne M. Riley, Houston, Tex., assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Mar. 27, 1985, Ser. No. 716,783
Int. Cl.[4] E21B *43/12*
U.S. Cl. 166—305.1 **21 Claims**

18. A method for shutting down a high pressure injection well penetrating a subterranean formation, said method involving the use of a relatively high density brine composition containing one or more water soluble calcium halide salts as a kill weight work-over fluid for confinement of formation fluid pressure and comprising the steps of:

a. injecting into said well an aqueous preflush composition which comprises an effective amount of a scale inhibitor, said preflush composition being injected in an amount sufficient to prevent any substantial intermingling of said formation fluids with said high density brine composition; and

b. subsequently placing said high density brine composition into said well so as to

(1) displace said preflush into said formation; and

(2) to counterbalance and contain the pressurized fluids in said formation.

4,630,680

WELL CONTROL METHOD AND APPARATUS

Hubert L. Elkins, Kingwood, Tex., assignor to Hydril Company, Los Angeles, Calif.

Continuation of Ser. No. 461,618, Jan. 27, 1983, abandoned. This application Mar. 15, 1985, Ser. No. 712,907
Int. Cl.[4] E21B *43/01*
U.S. Cl. 166—34.2 **30 Claims**

1. Well apparatus adapted for use with a floating drilling vessel and adapted for connection to the structural casing string in a well bore established beneath the seabed comprising,

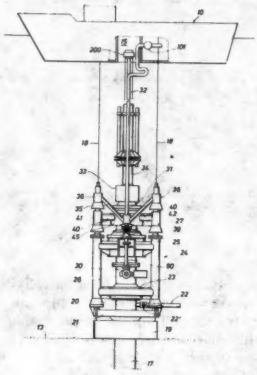
a conductor casing,

a first wellhead connected to the structural casing string,

a first conductor means for connecting a first conduit to the first wellhead,

an annular blowout preventer connected to the first conduit providing a flow path between the bore of the wellhead and the bore of the annular blowout preventer when the blowout preventer is normally open,

a valve disposed in a line connected to the first conduit between the blowout preventer and the first wellhead connector,



a kill line extending between the line and the drilling vessel, and

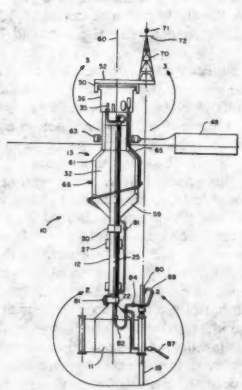
stripper and guidance means connected to the blowout preventer by a second connector for guiding said conductor casing through the blowout preventer and into the borehole and for stripping said conductor casing while it is being inserted therein.

4,630,681

MULTI-WELL HYDROCARBON DEVELOPMENT SYSTEM

William T. Iwamoto, Berkeley, Calif., assignor to Decision-Tree Associates, Inc., Berkeley, Calif.

Filed Feb. 25, 1985, Ser. No. 705,092
Int. Cl.[4] E21B *7/12*
U.S. Cl. 166—366 **10 Claims**



1. An offshore structure for development of a multi-well system by drilling through at least one of a plurality of piles securing a base structure for a center well to the seabed, comprising

a buoyant body connected to said base structure through at

least one universl joint means such that vertical motion of said buoyant body is substantially attenuated, said buoyant body including a containment means adapted to store and separate produced fluids, a compartmentalized external shell surrounding said containment means for ballasting and deballasting, a turntable above said containment means, skid beams affixed onto said turntable, a drilling rig mast means slidably mounted on said skid beams, and a jack means for moving said drilling rig means with respect to said skid beams, said turntable and said jack means being adapted to function cooperatively to position said drilling rig means over one of said piles.

8. A method for development of a multi-well system comprising the steps of

providing a base structure secured to the seabed by piles, a buoyant body connected to said base structure and including a containment means adapted for storage and/or processing, a production riser assembly passing through said containment means, a turntable with skid beams affixed thereonto, and a drilling rig movably disposed on said skid beams,

positioning said rig over one of said piles by rotating said turntable and moving said rig with respect to said skid beams,

drilling a cluster well through said one pile, and

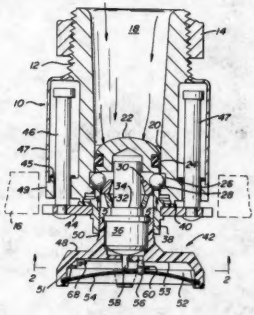
transporting produced fluids from said cluster well through said riser assembly into said containment means.

4,630,682

RAPID RESPONSE SPRINKLER HEAD

George S. Pieczykolan, North Wales, Pa., assignor to Central Sprinkler Corporation, Lansdale, Pa.

Filed Feb. 21, 1985, Ser. No. 703,979
Int. Cl.[4] A62C 37/08
U.S. Cl. 169—38 10 Claims



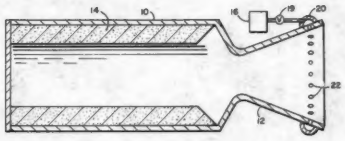
1. A rapid response sprinkler head comprising a housing having a flow passage therethrough, a valve member closing said passage, said valve member being supported by said housing and being movable to an open position, latch means including a frangible member for retaining said valve member in a closed position, an explosive detonator for fracturing said frangible member, and a temperature responsive controller for controlling the actuation of said detonator whereby said detonator fractures said frangible member when said controller senses a predetermined temperature to thereby enable said valve member to move to an open position, and said temperature responsive controller and said explosive detonator and deflector plate are supported by said valve member for movement therewith.

4,630,683

AFTERBURNING REDUCTION

Barry D. Allan, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 22, 1985, Ser. No. 801,023
Int. Cl.[4] A62C 1/14, 1/18, 3/08
U.S. Cl. 169—45 3 Claims



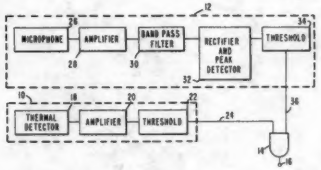
1. A method of reducing the visible flash from the exhaust nozzle of a rocket motor comprising injecting a fire extinguishing suppressant of a fluoro halogenated carbon compound into exhausting exhaust gases just prior to their exhausting from the exhaust nozzle of a rocket motor that has a fast burning solid propellant burning therein to substantially reduce visible flash of the exhausting gases of said rocket motor as the exhaust gases are exhausted from said exhaust nozzle and into contact with oxygen in the atmosphere to effectively control visible flash and afterburning of the exhaust gases which are fuel rich.

4,630,684

FIRE SENSING AND SUPPRESSION METHOD AND SYSTEM RESPONSIVE TO OPTICAL RADIATION AND MECHANICAL WAVE ENERGY

Robert J. Cinzori, Santa Barbara, and Mark T. Kern, Goleta, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Jun. 18, 1984, Ser. No. 621,645
Int. Cl.[4] A62C 37/04
U.S. Cl. 169—46 20 Claims



1. A method for sensing explosive fires which includes:

(a) sensing the substantially simultaneous occurrence of electromagnetic wave energy and mechanical wave energy emanating from said fire or explosion within a preselected time frame to in turn generate first and second detection signals, said mechanical wave energy being generated by an event likely to initiate a fire or explosion and preceding the generation of the electromagnetic wave energy; and

(b) simultaneously processing said first and second detection signals in parallel to generate a fire suppression output signal; and

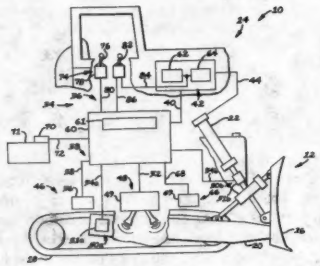
(c) activating a fire suppressant in response to said output signal.

4,630,685

APPARATUS FOR CONTROLLING AN EARTHMOVING IMPLEMENT

Francis B. Huck, Jr., Peoria, and David C. Janzen, Metamora, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Nov. 18, 1983, Ser. No. 553,271
Int. Cl.[4] A01B *63/112*; E02F *3/76*
U.S. Cl. 172—7 **12 Claims**



1. In an apparatus for controlling an earthmoving implement of an earthmoving machine, said earthmoving machine being movable at a longitudinal angular velocity and said earthmoving implement being movable to a plurality of up/down positions, said apparatus including actuatable means for controllably raising and lowering said earthmoving implement to any of said plurality of positions, the improvement comprising:

means for sensing longitudinal angular velocity and producing an angular velocity signal in response to said sensed longitudinal angular velocity; and

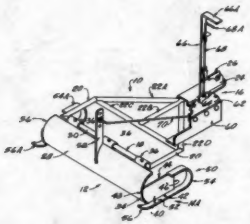
means for receiving said angular velocity signal and controlling said actuatable means in response to said received angular velocity signal.

4,630,686

EARTH SCRAPER FOR USE WITH A SMALL TRACTOR

Dee H. Ausmus, Jr., 2000 W. Taft, Sapulpa, Okla. 74066

Filed Jun. 27, 1985, Ser. No. 749,523
Int. Cl.[4] E02F *3/64, 3/76*
U.S. Cl. 172—393 **2 Claims**



1. An earth scraper for use with a small tractor having a hitch comprising:

a generally horizontal frame having a forward end and a rearward end, the forward end having means for removable attachment to a hitch of a tractor;

an elongated blade of semi-circular, cross-sectional configuration taken perpendicular the longitudinal axis thereof providing a concave forward surface and a convex rearward surface, opposed ends, and a top and bottom edge, the top edge being pivotally secured to said frame rearward end, the bottom edge forming a scraping edge;

a first and a second vertical skid plate, each skid plate having a rearward end, a forward end, a top edge and a bottom edge, the rearward edge of the first skid plate being affixed to one end of said blade and the rearward edge of the second skid plate being affixed to the other end of said blade, the top and bottom edges of both plates being perpendicular to the plane of said blade longitudinal axis, and the lower edge of both skid plates being above said bottom edge of said blade; and

a first runner formed of an elongated flat piece of metal attached to said first skid plate lower edge and extending forwardly of said forst skid plate forward edge in an arcuate configuration and one end of the first runner being attached to said skid plate upper edge, the other end of the runner extending rearwardly of said blade;

a second runner configured as said first runner and being attached to said second skid plate; and

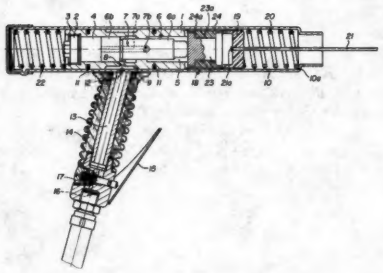
means to rotationally adjust said blade relative to said frame.

4,630,687

PERCUSSION DEVICE

Paul Dummermuth, Zunzgen, Switzerland, assignor to Von Arx AG, Sissach, Switzerland

Filed Nov. 1, 1984, Ser. No. 667,281
Claims priority, application Switzerland, Nov. 4, 1983, 5962/83
Int. Cl.[4] B25D *9/00*
U.S. Cl. 173—131 **3 Claims**



1. A percussion device comprising

an elongate housing from the front end of which a tool projects axially,

a tool holder mounted to slide longitudinally inside the housing,

an axially displaceable anvil in the housing having a front end forwardly axially engageable with the tool, a rear end, and a sliding surface between the ends slidably supporting the anvil in the housing;

a spring which presses the tool axially backward against the front end of the anvil;

a cylinder the front end of which is axially forwardly engageable with the rear end of the anvil and which is open;

a free piston which is axially movable in the cylinder and which acts as a percussion device axially forwardly engageable with the rear end of the anvil, and

drive means to start up and maintain a series of percussions of the said percussion device against the said anvil,

characterized in that

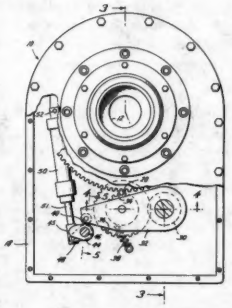
the anvil comprises a high-density metal body integrally forming the front and rear ends of the anvil and at least one low-density annular body of plastics material encircling the metal body and forming the sliding surface thereof, the total volume occupied by this plastics material being a substantial portion of the total volume of the anvil.

4,630,688

POWER SPINNER FOR ROTATING A KELLY JOINT

Martin E. True, and Clarence W. Sullivan, both of Houston, Tex., assignors to Weatherford/Lamb, Inc., Houston, Tex.

Filed Jun. 24, 1981, Ser. No. 278,438
Int. Cl.[4] E21B *3/00*
U.S. Cl. 173—163 **4 Claims**



1. In a power spinner for rotating a kelly joint having a pipe sub rotatably mounted in a housing, a ring gear on said sub, and a reversible motor mounted on the housing for powering the ring gear and sub in either direction, the improvement comprising,

a drive gear connected coaxially to the motor,

a shifting arm pivotally mounted coaxially with the axis of the drive gear,

a movable gear is positioned in the plane of the ring gear and mounted on the shifting arm for engagement and disengagement with the ring gear, said movable gear connected to and driven by the drive gear and rotatable about the drive gear,

a cam engaging the arm for rotating the arm about the axis of the drive gear for laterally moving the movable gear toward and away from the ring gear, said cam including a locking surface for holding the gears together when engaged, and

power actuated means connected to the cam for actuating the cam to the locked position.

4,630,689

DOWNHOLE PRESSURE FLUCTUATING TOOL

Edward M. Galle, Friendswood, and Billey E. Baker, Houston, both of Tex., assignors to Hughes Tool Company-USA, Houston, Tex.

Filed Mar. 4, 1985, Ser. No. 708,207
Int. Cl.[4] E21B *7/24*
U.S. Cl. 175—56 **3 Claims**

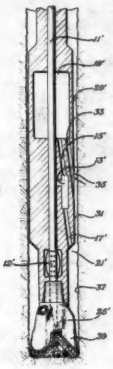
1. A pump drive, downhole pressure fluctuating tool having an improved acoustical circuit that comprises:

a body adapted for connection with a string of pipe in a well, with a passage to receive liquid from the pump;

a fluid oscillator connected with the passage of the body, including two output leg means to generate out-of-phase pressure fluctuations;

two acoustical compliance means, each connected to an output leg, one of said compliance means having walls partially defined by the tool exterior and partially by the wall of well and the other being defined by walls inside the tool;

an acoustical inertance means connecting the two acoustical compliance means, with a pressure node at the midregion, said midregion communicating with the annulus between



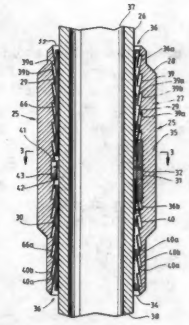
the body and the wall of the hole to discharge fluid from the body.

4,630,690

SPIRALLING TAPERED SLIP-ON DRILL STRING STABILIZER

Thomas R. Beasley, Katy, and Chuan C. Teng, Houston, both of Tex., assignors to Dailey Petroleum Services Corp., Conroe, Tex.

Filed Jul. 12, 1985, Ser. No. 755,053
Int. Cl.[4] E21B *17/10*
U.S. Cl. 175—57 **29 Claims**



1. A stabilizer for use in a drilling string comprising:

a substantially cylindrical body member having a central passageway to accommodate the drill string, the inside surface of the body member defining a right-hand spiralling thread with a tapered trailing edge which spirals from a starting point on said body member, said thread terminating internally of said body member in an arcuate recess extending around the interior of said body member;

a key member is secured to the inner wall surface of said recess of said body member, said key member having a lug extending longitudinally of said body member within said recess;

a slip member adapted to thread within the body member between said body member and said drill string, the slip defining a right-hand thread with a matching tapered trailing edge configured to make up with said right-hand thread on said body member and to wedge between said

body member and said drill string, one end of said slip terminating in a longitudinally disposed shoulder capable of abutting said lug upon threading of said slip within said body member.

4,630,691

ANNULUS BYPASS PERIPHERAL NOZZLE JET PUMP PRESSURE DIFFERENTIAL DRILLING TOOL AND METHOD FOR WELL DRILLING

David W. Hooper, 1500 E. Warren Space 82, Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 496,133, May 19, 1983, abandoned. This application Dec. 26, 1984, Ser. No. 686,241

Int. Cl.[4] E21B *7/00*

U.S. Cl. 175—65 40 Claims

1. A pressure differential drilling tool for reducing circulating fluid pressure in a drilling zone at the bit-to-bore bottom interface of a drill bit operated by a drilling string to continuously make hole in a well bore and including;

a body coupled to the lower end of the drilling string and carrying the drill bit for bit-to-bore bottom engagement and conducting circulating fluid under pressure and for removing formation chips from the bore bottom,

a pressure expandable plug-stabilizer rotatably surrounding the body on bearings to advance down-hole therewith and having expansion limiting means restricting the plug-stabilizer to less than the diameter of the well bore for free sliding engagement therein withing a controlled annulus bypass of circulating fluid between the plug-stabilizer and the surround well bore and standing under pressure in the well bore annulus above the plug-stabilizer and isolated from said drilling zone below the plug-stabilizer,

and a jet pump with a suction tube open from said drilling zone and a diffuser open into the well bore above the plug-stabilizer and having a flow restricting nozzle sharing the flow of circulating fluid under pressure with a port opening within the plug-stabilizer to expand and modulate the diameter of the same while ejecting the chip laden circulating fluid and significantly reducing the pressure thereof within the drilling zone.

40. A method of annulus bypass underbalanced rotary drilling of a well bore, and including;

rotating a drilling string made up of a drill pipe supplied with circulating fluid under pressure and with the weight thereof applied to a drill bit at the lower end thereof to penetrate the bit-to-bore bottom interface for continuously making hole,

placing a pressure expandable plug-stabilizer immediately above the drill bit and rotating the drilling string therethrough and defining a drilling zone below the plug-stabilizer,

reducing the circulating fluid pressure in the drilling zone by pump means operating as a result of the flow of circulating fluid under pressure to the drill bit,

and sharing the circulating fluid pressure with the pressure expandable plug-stabilizer to expand the same to the proximate diameter of the well bore to modulate a downward annulus bypass surrounding the plug-stabilizer to control the flow of circulating fluid into the drilling zone while continuously making hole.

4,630,692

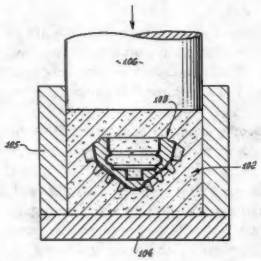
CONSOLIDATION OF A DRILLING ELEMENT FROM SEPARATE METALLIC COMPONENTS

Gunes M. Ecer, Irvine, Calif., assignor to CDP, Ltd., Newport Beach, Calif.

Continuation-in-part of Ser. No. 656,641, Oct. 1, 1984, Pat. No. 4,554,130, which is a continuation-in-part of Ser. No. 633,508, Jul. 23, 1984, Pat. No. 4,562,892. This application Jun. 10, 1985, Ser. No. 743,308

Int. Cl.[4] E21B *10/00*

U.S. Cl. 175—330 22 Claims



1. The method of forming a cutter, which includes a core and wear resistant insert defining a body means which includes:

(a) applying to the body means a mixture of:

(i) wear resistant powder, and

(ii) binder

said mixture being in fluid state and applied to said body means by one of the following:

(i) dipping of the body means into said mixture,

(ii) painting said mixture on the body means,

(iii) spraying the mixture onto the body means,

(b) volatilizing the binder

(c) and applying sufficient pressure via a grain bed to the body means and powder at elevated temperature, to consolidate same,

(d) at least one of the core and insert being consolidated at the same time as step (c) is carried out.

4,630,693

ROTARY CUTTER ASSEMBLY

Robert D. Goodfellow, Meadowbrook Ter., Bedford, Pa. 15522

Filed Apr. 15, 1985, Ser. No. 723,139

Int. Cl.[4] F21B *10/20*

U.S. Cl. 175—366 9 Claims

1. A rotary cutter assembly comprising:

a drill head adapted at an upper portion thereof for coupling to a drill string for rotation about a central axis and having at a lower portion thereof a plurality of angularly spaced receptacles defined between a pair of opposing containment walls and adapted for receiving a shank of a drill bit unit;

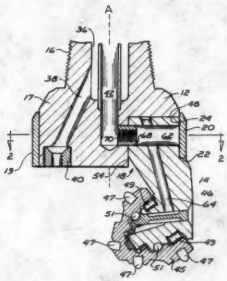
each said containment wall being traversed by an axial groove extending substantially parallel to the central

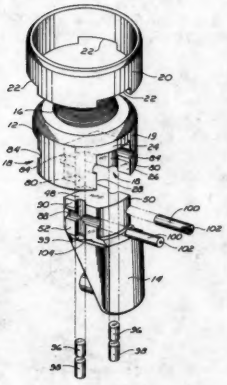
rotational axis and a transverse groove extending substantially orthogonally to the central rotational axis;

at least one bit unit comprising a shank receivable in a said receptacle and having axial and transverse grooves complementary with said longitudinal and transverse grooves of said drill head and cooperatively alignable therewith upon reception of said shank in a said receptacle;

first lock pin means receivable in said complementary axial grooves of said drill head and the said shank to releasably secure the shank transversely relative to the drill head; and

second lock pin means receivable in said complementary transverse grooves of said drill head and the said shank to releasably secure the shank axially relative to the drill head.





6. A rotary cutter assembly comprising:

a drill head adapted at an upper portion thereof for coupling to a drill string for rotation about a central axis and having at a lower portion thereof a plurality of angularly spaced receptacles defined between a pair of opposing containment walls and adapted for receiving a shank of a drill bit unit, said lower portion forming a segmented cylindrical peripheral surface extending between said receptacles;

at least one drill bit unit comprising a shank which is receivable in a said receptacle;

locking means to releasably secure the shank in said receptacle in a fixed position with said drill head; and

a wear sleeve extending circumferentially of said drill head and interiorly engaging said segmented cylindrical surface and said shank.

4,630,694

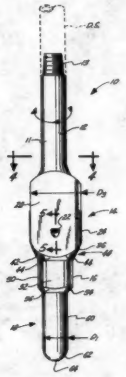
INTEGRAL BLADE HOLE OPENER

Paul G. Walton, 211 Hamner Dr., Houma, La. 70364, and Percy A. Little, 5825 Cherokee La., Alexandria, La. 71301

Filed Oct. 16, 1985, Ser. No. 788,011

Int. Cl.[4] E21B *10/26*

U.S. Cl. 175—391 10 Claims



1. A drill string tool apparatus for enlarging the size of oil/gas holes comprising:

a. a tool body having at least a portion thereof with a generally triangular cross-sectional area that includes three radially spaced blades;

b. means for forming a removable connection between the tool body and a drill string;

c. the tool body having an open ended flow conveying longitudinal internal bore for circulating fluids between the tool body and a drill string connected thereto;

d. the body including a triangular midsection comprising:

i. three longitudinal, radially spaced apart midsection blade members that are parallel to the central axis of the tool body bore so that the blade members can cut into the walls of the bore hole to enlarge the size of the bore hole;

ii. three generally flat flow zone surfaces which span between the midsection blade members;

e. each said midsection blade member comprising:

i. a contact surface area means carried on the blade member for defining the radial dimensional limit of the tool body during a rotation of the tool body and a connected drill string;

ii. a longitudinally extending cutting edge positioned adjacent the contact surface area means;

f. pilot section means positioned on the tool body below the midsection and having a smaller outer diameter than the outer diameter of the midsection during rotation of the tool body, for gradually enlarging the size of the bore hole, comprising:

i. three longitudinal, radially spaced apart pilot section blade members that are parallel to the central axis of the tool body bore;

ii. three annular flow zone surfaces which span the distance between the pilot section blade members; and

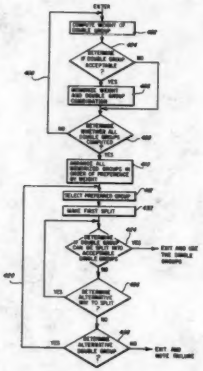
g. a lowermost, generally cylindrical bull nose tip portion of the tool body having a substantially rounded end portion for guiding the tool body through the bore hole.

4,630,695

COMBINATORIAL WEIGHER EMPLOYING DOUBLE GROUP SPLIT LOGIC

Robert H. Connors, Chicago, and James T. Williams, Wilmette, both of Ill., assignors to Triangle Package Machinery Co., Chicago, Ill.

Filed Feb. 20, 1985, Ser. No. 703,343
Int. Cl.[4] G01G 19/22
U.S. Cl. 177—1 9 Claims



1. A method for making up multiple discrete quantities of solid product, each having a preferred product weight, from a plurality of product holding chambers without refilling such product holding chambers, said method comprising the steps of:

(a) establishing an acceptable range of the preferred product weight to be delivered from a single group of holding chambers;

(b) establishing an acceptable range of a multiple product weight to be delivered from a multiple group of holding chambers;

(c) registering the weight of product stored in each of said holding chambers;

(d) calculating a multiple group combination of said holding chambers having a multiple product weight within the acceptable range established therefor;

(e) splitting said multiple group combination to yield multiple single groups of holding chambers which each have a preferred product weight within the acceptable range established therefor; and

(f) making up multiple discrete quantities of said product from said multiple single groups of said holding chambers comprising said multiple group combination.

4,630,696

APPARATUS AND METHOD FOR AUTOMATIC SYSTEM CALIBRATION TO PROVIDE ENHANCED RESOLUTION IN COMPUTERIZED WEIGHING SYSTEMS

Tadeusz F. Kemnitz, Chapel Hill, N.C., assignor to Azionaria Costruzioni Macchine Automatiche, Bologna, Italy

Filed Oct. 25, 1985, Ser. No. 791,322
Int. Cl.[4] G01G 13/14, 19/22
U.S. Cl. 177—165 16 Claims

1. An apparatus for calibrating voltages corresponding to measured weight in an automatic combination weighing machine so as to provide a tare weight voltage which does not consume a significant portion of the range of voltages for indicating total measured weight, said apparatus comprising:

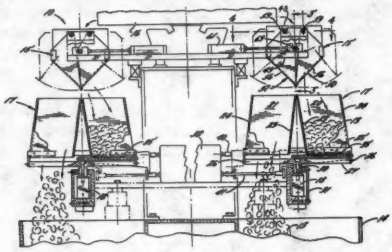
a bucket for holding product to be weighed;

weighing means for providing an electrical signal indicative of the combined weight of bucket and product;

computer means having

(a) means to identify which buckets are empty;

(b) means for determining if an electrical signal from said weighing means is within a first predetermined range of an ideal value indicative of tare weight; and



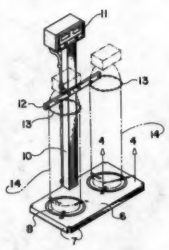
(c) means for adjusting the signal from said weighing means in response to an indication from means (b) that the signal is outside said predetermined range and an indication from means (a) that the signal is indicative of tare weight.

4,630,697

STRAIN GAUGE SCALE

Russell D. Hartman, Perkasie, and Edward M. Dougherty, Ottsville, both of Pa., assignors to Scaletron, Inc., Perkasie, Pa.

Filed Sep. 20, 1985, Ser. No. 778,029
Int. Cl.[4] G01G 3/14, 3/08; G01L 1/22
U.S. Cl. 177—211 9 Claims



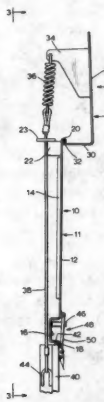
1. A scale comprising at least two weighing discs, a common platform for supporting the discs, with the discs arranged in side-by-side relation, and for each disc a set of three load cells for suspending the disc from the platform, the load cells of each set being equally spaced around the periphery of the disc, and each load cell of each set being elongated radially of the disc, with a first portion extended radially inboard below the periphery of the associated disc and with a second portion extended radially outboard of the periphery of the disc below a portion of the supporting platform, for each load cell of each set fastening means rigidly interconnecting the associated weighing disc and said first portion of the load cell at points spaced from each other radially of the associated disc, and for each load cell of each set means for connecting the load cell with the platform comprising a flexible cable connected with said second portion of the load cell, and for each load cell of each set a strain gauge mounted on the load cell intermediate said fastening means and connecting means.

4,630,698

SELF-STORING SIDE PANEL

Robert L. Siewert, Benton Harbor, and Edmund K. Varnelis, St. Joseph, both of Mich., assignors to Clark Michigan Company, Cleveland, Ohio

Filed Aug. 13, 1985, Ser. No. 765,090
Int. Cl.[4] B62D *25/10*
U.S. Cl. 180—69.24 9 Claims



1. A panel mechanism for a vehicle engine compartment which has a lower side frame member extending longitudinally of the vehicle adjacent one side of the compartment, the lower side frame member having an inside surface, and an upper structural portion extending longitudinally above the lower side frame member and forming with said lower side frame member an access opening into the engine compartment, the upper structural portion having an inside surface, the panel mechanism comprising

a movable side panel which in the closed position extends across said access opening,

first means detachably securing the upper edge of said panel to said inside surface of said structural portion,

at least one vertically disposed guide cable extending from a support on the inside surface of the upper structural portion to said inside surface of the lower frame member,

a guide secured to said panel through which said guide cable extends, and

second means for securing the lower edge of said panel to the lower side frame member with said first means secured, and releasing the lower edge of said panel from said lower side frame for detaching said upper edge of the panel from said upper structural portion and allowing the panel to move by gravity to the open position outside the engine compartment.

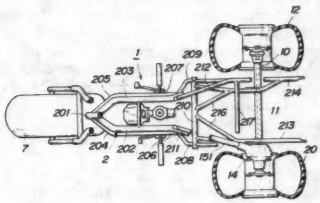
4,630,699

DRIVING WHEEL SUPPORTING SYSTEM

Kozo Yamada, and Yoshikazu Washizawa, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP84/00392, § 371 Date Mar. 21, 1985, § 102(e) Date Mar. 21, 1985
PCT Filed Jul. 31, 1984, Ser. No. 718,020
Claims priority, application Japan, Aug. 2, 1983, 58-141403
Int. Cl.[4] B60K *17/04*
U.S. Cl. 180—75 3 Claims

1. A driving wheel supporting system comprising: a pair of plate-like brackets secured respectively to the left and right frames of a vehicle body; a pipe extending between said brackets for supporting a driving axle shaft, said pipe having one end welded to one of said brackets, an intermediate portion welded to the other bracket and the other end projecting outwardly from said other bracket, said driving axle shaft being disposed in said pipe and having one end portion supported on a bearing mounted in said other end of said pipe, said one end portion of said driving axle shaft supporting thereon one of left and right



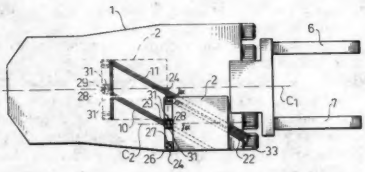
wheels; and a final power transmission unit including a transmission mechanism mounted on said one bracket at one surface thereof extending in a plane outside said frames, the other end of said driving axle shaft being connected to said transmission mechanism and being supported on a bearing mounted therein.

4,630,700

ADJUSTABLE OPERATOR CAB ON A MOTOR-DRIVE TRUCK

Nils-Olof Larsson, Halmstad, Sweden, assignor to Kalmar LMV, Ljungby, Sweden

Filed Nov. 14, 1985, Ser. No. 798,111
Claims priority, application Sweden, Dec. 3, 1984, 8406091
Int. Cl.[4] B62D *33/06*
U.S. Cl. 180—89.13 8 Claims



1. A motor-driven truck comprising a longitudinal chassis, a lifting stand mounted on the front end thereof, first guide and journalling means including a longitudinal, stationary stand mounted on the chassis, second guide and journalling means including a stand movable along said stationary stand, an operator's cab supported by said movable stand and arranged to be placed in a desired position which is variable with respect to said stationary stand and to the front lifting stand as well, said first guide and journalling means including journalling elements which are firmly connected to the movable stand and guided by the stationary stand, and first and second force-transmitting means arranged for moving the operator's cab to said desired position, said stationary stand being diagonally arranged so that it encompasses an acute angle α together with a longitudinal center line of the truck and so that it extends between a rear place at substantially said longitudinal center line and a front place at substantially a front corner of the truck near one side of the front lifting stand, said movable stand including a horizontal stand member located under the operator's cab and a vertical stand member rigidly connected to the horizontal stand member and arranged close to the rear surface of the operator's cab facing away from the front lifting stand, said journalling elements being firmly mounted onto the under side of the horizontal stand member of the movable stand, said second guide and journalling means including journalling

elements firmly connected to the operator's cab and guided by the vertical stand member of the movable stand, said first force-transmitting means being connected to the stationary stand and to the horizontal stand member of the movable stand for controlled movement of the operator's cab and the movable stand along the stationary stand, and said second force-transmitting means being connected to the rear surface of the operator's cab facing away from the front lifting stand and to the movable stand for controlled movement of the operator's cab along the vertical stand member of the movable stand, the operator's cab being thus arranged to be placed in said desired position with its horizontal longitudinal central line maintained parallel to the said longitudinal center line of the truck and with maintained alignment in a vertical plane.

4,630,701

VEHICLE STEERING MECHANISM

Juhani T. Venetjoki, Helsinki, Finland, assignor to Lokari-Tuote Oy and Auto Lokari Oy, both of Metallitie, Finland

Filed Mar. 25, 1985, Ser. No. 715,793
Claims priority, application Finland, Apr. 6, 1984, 841372
Int. Cl.[4] B62D *3/12*
U.S. Cl. 180—209 **3 Claims**

1. A vehicle steering mechanism in which a pair of king pins are mounted on the vehicle, with means for positioning said king pins at differing axial distances from each other to adjust the track of the vehicle, the improvement comprising:

a forwardly extending control arm connected to one of said king pins,

a rearwardly extending control arm connected to the other of said king pins,

a pair of articulating links, one each connected to each of said control arms, and

a tie rod mechanism connected between said articulating links, said tie rod mechanism comprising:

a first transversely extending rack having a free end and a connecting end, means connecting said connecting end to one of said articulating links, a second transversely extending rack having a free end and a connecting end, means mounting said second rack in parallel juxtaposition to said first rack, means connecting said connecting end of said second rod to the other of said articulating links,

a steering gear, means mounting said steering gear between said racks in mutual engagement with each of said racks so that rotation of said gear is translated uniformly to cause simultaneous opposite movement of each of said racks.

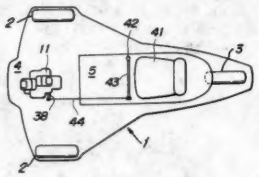
4,630,702

THREE-WHEELED MOTOR VEHICLE GEAR SHIFT MECHANISM

Shoichiro Irimajiri, Mie; Katsusuke Komuro, and Kunihiko Aikawa, both of Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1984, Ser. No. 605,404
Claims priority, application Japan, Apr. 28, 1983, 58-63059
Int. Cl.[4] B62D *61/06*; B60K *17/00*
U.S. Cl. 180—215 **5 Claims**

1. A three-wheeled motor vehicle having a body, two front wheels and one rear wheel with an engine mounted in a front section of the vehicle body containing said front wheels, comprising, a transmission formed integrally with said engine and having a gear shift spindle projecting from one side thereof, a control mechanism for controlling said transmission, said vehicle body including a passenger compartment having a floor, and said control mechanism comprising a rod rotatably secured to said floor via an attachment member, and both said rod and said attachment member extending laterally of said vehicle body across substantially all of said compartment, a shift lever coupled to one end of said rod at a right angle



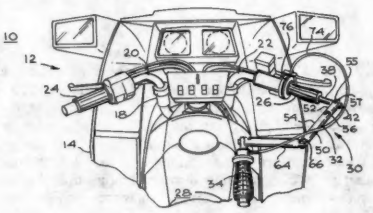
thereto, and connector means coupling the other end of said rod to said gear shift spindle, wherein the control mechanism rod only is rotated about its axis by movement of said shift lever longitudinally to said vehicle body.

4,630,703

TWO-WHEELED MOTOR VEHICLE ASSEMBLY

James D. Fletcher, P.O. Box 218, Bodfish, Calif. 93205

Filed Dec. 12, 1985, Ser. No. 808,246
Int. Cl.[4] B62K *11/14, 23/04*
U.S. Cl. 180—219 **14 Claims**



1. An improved two-wheeled motor vehicle assembly, said assembly comprising, in combination:

a. a two-wheeled motor vehicle having a frame and a pair of wheels, one in front and one in the rear, a steering column, including a pair of handlebars, with a pair of handles, a seat and a motor with carburator, throttle and throttle linkage, and a throttle control connected to one of the handles and to said throttle linkage; and,

b. an auxiliary steering device comprising an elongated movable arm connected to at least one of said handlebars and extending rearwardly therefrom to an area adjacent said seat, whereby a rider can sit back in said seat with hands off of said handlebars and accurately steer said vehicle through said auxiliary steering device, said auxiliary steering device also including a throttle control extension means connected to the rear portion of said elongated arm and to said throttle control.

4,630,704

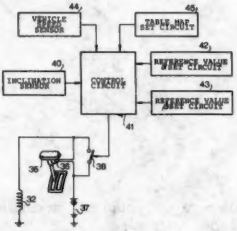
SYSTEM FOR CONTROLLING A POWER TRANSMISSION OF A FOUR-WHEEL DRIVE VEHICLE

Toru Yamakawa; Fujio Makita, both of Hachioji; Mitsuo Umezawa, and Ryuzo Sakakiyama, both of Tokyo, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,557
Claims priority, application Japan, Sep. 20, 1983, 58-173595
Int. Cl.[4] B60K *23/08*
U.S. Cl. 180—247 **4 Claims**

1. In an improved system for controlling a power transmis-

sion of a four-wheel drive vehicle powered by an engine having a transmission for transmitting the power of said engine to main driving wheels of said four-wheel drive vehicle, a clutch for transmitting the power to auxiliary driving wheels, second sensor for detecting the speed of the vehicle and for producing a speed output signal dependent on the speed, circuit means for operating said clutch in accordance with driving conditions, wherein the improvement comprises



a first sensor for detecting the inclination of roads and for producing an inclination output signal dependent on the inclination, and

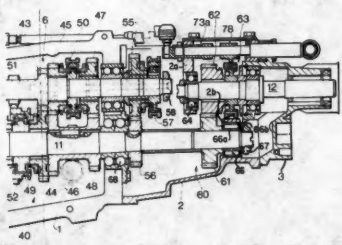
said circuit means includes control means responsive to said output signals from said first sensor and said second sensor for engaging said clutch when said speed output signal is smaller than a predetermined speed signal which is decided by the inclination of the road.

4,630,705

TRANSMISSION FOR A FOUR-WHEEL DRIVE MOTOR VEHICLE

Toshio Kobayashi, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 21, 1985, Ser. No. 747,508
Claims priority, application Japan, Jul. 4, 1984, 59-139336
Int. Cl.[4] B60K *17/34*
U.S. Cl. 180—247 **8 Claims**



1. In a transmission system for a four-wheel drive motor vehicle having a transmission disposed in a transmission case, the transmission having an output shaft rotatably supported in said transmission case, an end portion of the output shaft extending out of the transmission case and constituting an extended portion of the output shaft, and a transfer device disposed in a transfer case for transmitting the output of the transmission to auxiliary drive wheels of the vehicle through an auxiliary drive shaft, the transfer device comprising a transfer drive gear secured to the extended portion of the output shaft of the transmission and a transfer driven gear mounted on the auxiliary drive shaft and engaged with the transfer drive gear, the improvement in the system wherein

the transfer case has a wall forming a hole,

a bearing having an outer ring and an inner ring,

said outer ring being disposed in said hole and secured to said wall of the transfer case, and

said inner ring being mounted on said extended portion of the output shaft on a side of the transfer drive gear facing away from said transmission case,

a nut engageable with said extended portion of the output shaft,

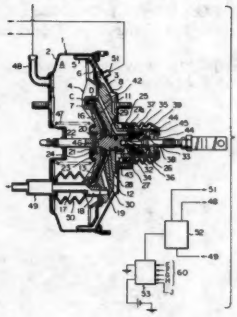
said extended portion of the output shaft being inserted into said outer ring with the inner ring being secured to said extended portion of the output shaft by said nut engaged on said extended portion of the output shaft, so that the extended portion of the output shaft is rotatably supported by said bearing at said side of the transfer drive gear facing away from said transmission case.

4,630,706

VEHICLE BRAKING SYSTEM

Toshio Takayama, Kanagawa, and Tetsuo Haraikawa, Chiba, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Dec. 19, 1984, Ser. No. 683,553
Claims priority, application Japan, Jan. 28, 1984, 59-14063
Int. Cl.[4] B60K *28/00*
U.S. Cl. 180—273 **5 Claims**



1. A vehicle braking system including a pneumatic booster which includes a shell casing, a flexible diaphragm, a power piston connected to the diaphragm to define a constant pressure chamber and a variable pressure chamber in the shell casing, an input shaft, a valve mechanism provided in the power piston and associated with the input shaft to control the pressure in the variable pressure chamber, an output shaft receiving the output force from the power piston, and a reaction mechanism for the reaction force of the output shaft to the input shaft, wherein the booster further comprises a control chamber, and a control piston partitioning the interior of the control chamber into a second constant pressure chamber and a second variable pressure chamber, said control piston being associated with the input shaft such that the control piston applies a force to the input shaft in the brake applying direction when the control piston is displaced by receiving the differential pressure between two second chambers.

4,630,707

SOUND-ABSORBING STRUCTURE IN VEHICULAR COMPARTMENT

Shinjiro Yukawa, Isehara, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

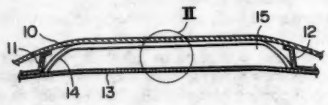
Filed Aug. 30, 1985, Ser. No. 770,978
Int. Cl.[4] E04B *1/82*
U.S. Cl. 181—288 **5 Claims**

1. A sound-absorbing structure in a vehicular compartment, comprising:

a panel forming part of a vehicular body;

a porous sound-absorbing lining separated from the inner surface of said panel by a space; and

means, being air-impermeable and disposed within the space,



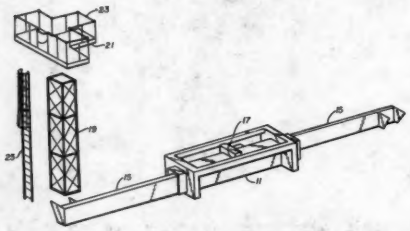
for preventing air leakage between the inside and the outside of the vehicular compartment through the space, said sound-absorbing lining and said preventing means defining an air chamber.

4,630,708

SEMI-ADJUSTABLE SERVICE PLATFORM APPARATUS FOR GANTRY CRANE

George J. Thompson, 134 Watersedge, Ocean Springs, Miss. 39564

Filed Jan. 29, 1986, Ser. No. 823,565
Int. Cl.[4] E04G *3/10, 3/16*
U.S. Cl. 182—12 2 Claims



1. A service platform apparatus for a gantry crane having a crane support structure, a horizontal boom structure and gantry, a trolley moveable on said boom and gantry, lifting ropes depending from said trolley and actuated by crane mounted hoist machinery, and a head block reeved to the lower ends of said lifting ropes, said service platform apparatus comprising

a base frame adapted to be releasably secured to said head block, said base frame including a pair of horizontally sliding beams which are extendible in opposite directions from said base frame with either an integrated or independent movement,

a pair of detachable towers secured to the ends of said sliding beams which project outboard from said base frame, said towers including detachable work platforms at the upper ends thereof, said towers being sized to stack on top of said base frame when disassembled and said base frame with the towers disposed thereon sized to fit into a standard 40' container along with the two work platforms when the platforms are stacked on top of each other and disposed in one end of the same container, and

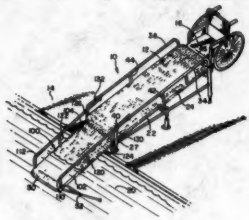
remote control means on said platforms for permitting an operator on a particular platform to independently control the reciprocating movement of the sliding beams for moving the platforms inboard and outboard relative to the base frame and to control the hoisting and translational motions of the crane trolley.

4,630,709

POOL ENTRY AND EXIT DEVICE

William Taylor, 209 Park Ave., Lake Park, Fla. 33403

Filed Nov. 6, 1985, Ser. No. 795,636
Int. Cl.[4] A63G *21/04*
U.S. Cl. 182—48 15 Claims



1. A foldable pool entry and exit device for use by non-ambulatory persons comprising:

ramp means comprising at least upper and lower ramp portions, the portions being linked by hinge means, the ramp surface comprising a friction material adapted to prevent slippage; and,

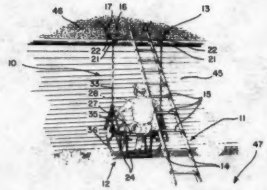
support means adapted to position the upper ramp means above the pool deck at a height substantially equal to the height of a wheel chair seat such that the ramp means extends angularly downward at a gentle slope to a position at least adjacent the surface of the water, at least a portion of said lower ramp portion extending over the water, whereby the user can enter and exit the water in a controlled fashion and with a minimum of exertion, and whereby the lower ramp portion can be pivoted out of the swimming area and folded to overlap the upper ramp portion when not in use.

4,630,710

ELEVATABLE WORK STATION

Furney M. Eubanks, Rte. 2, Box 361, Trenton, N.C. 28585

Filed May 9, 1985, Ser. No. 732,189
Int. Cl.[4] E06C *7/12;* E04G *3/10*
U.S. Cl. 182—116 11 Claims



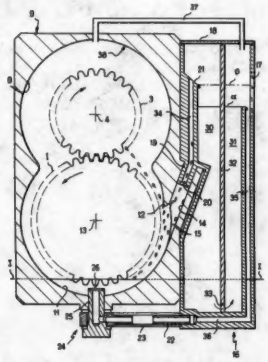
1. An elevated work station comprising: a portable support means; a work platform having a pair of take-up drums rotatively mounted on opposite sides thereof, said take up drums having a common axis of rotation extending transversly beneath said work platform; a pair of line-like means extending between said support means and said work platform for suspending said work platform at an elevated position relative to the ground, each said line-like means being wound about a respective take-up drum; rotation prevention means extending upwardly from said work platform to a point above and in alignment with said take up drums for engaging said line-like means and preventing said work platform from rotating about said axis of rotation of said take-up drums thereby maintaining said work platform in a level position relative to the ground; and means for rotating said take-up drums wheeby said work station can be controllingly moved upwardly and downwardly.

4,630,711

DEVICE FOR LUBRICATING A GEARTRAIN

Roland Levrai, Stains; Pierre Courbot, Villiers-le-Bel, and Pascal Picot, Bonneuil-sur-Marne, all of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Jun. 19, 1985, Ser. No. 747,083
Claims priority, application France, Jun. 27, 1984, 84 10143; Apr. 10, 1985, 85 05377
Int. Cl.[4] F01M *9/06, 11/02;* F16N *7/36*
U.S. Cl. 184—6.12 11 Claims



1. A device for lubricating a geartrain arranged in an internal chamber of a housing, said chamber having a bottom part which forms a storing area for storing a lubricant for the gear train and in which a bottom part of one of the gears rotating around an axis is normally immersed, characterized in that the chamber has, at least locally around the one gear, a peripheral inner profile matching substantially the peripheral outline of said one gear, adjacent the latter, and comprises, at a level higher than that of said bottom part of said chamber, a separating nose extending inwardly into said chamber and toward the periphery of said one gear and connected to a discharge conduit which is formed in said housing and opens inwardly in said chamber in front of said nose relative to a direction of rotation of said one gear, the discharge conduit communicating outwardly with a top part of a lubricant storage container located outside said housing and having a base portion communicating with said bottom part of said chamber via an external return conduit, said storage container defining a generally vertical inner accumulation volume divided, by a partition wall, into first and second chambers intercommunicating via a passage formed in a lower part of said partition wall, said discharge conduit opening outwardly, at a first level, in an upper part of said first chamber, and the storage container further comprising a feeding conduit having a lower portion communicating with said bottom part of said internal chamber and opening upwardly at a second level into an upper part of said second chamber.

4,630,712

AUTOMATIC CHAIN LUBRICATING SYSTEM

Rex A. Hoseley, Wheaton, Md., assignor to United States Postal Service, Washington, D.C.

Filed Aug. 24, 1981, Ser. No. 295,360
Int. Cl.[4] F16N *7/00, 29/00*
U.S. Cl. 184—15.3 1 Claim

1. An apparatus for lubricating a chain having links of a fixed length arranged in spaced apart rows and cross pins connecting the links and including rollers positioned between the rows and adapted to ride within a chain sprocket or gear, said apparatus comprising

a source of lubricant;

lubricant transfer means connected to said source of lubricant for delivering a given quantity of lubricant to the chain upon receipt of a signal;

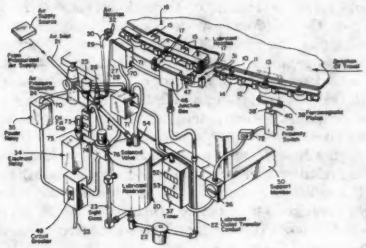
said lubricant transfer means comprising a plurality of nozzles positioned adjacent to said chain and directed toward the links thereof;

said lubricant transfer means further including high-speed solenoid operated valve mechanisms in operative association with each of said lubricant nozzles; and

ferromagnetic means positioned at fixed points along the chain sprocket or gear on which said chain is cause to rotate;

electromagnetic sensing means for generating a signal in response to proximate contact with said ferromagnetic means caused by rotation of said sprocket and chain;

said signal causing said solenoid valves to open and deliver a minute, predetermined quanity of lubricant through each of said lubricant nozzles and onto said chain at precise points thereof as defined by the preset position of said ferromagnetic means relative to said chain;



a timing device in operative electrical association with said electromagnetic sensing means and adapted to control the time cycle of the signal produced by said sensing means whereby said solenoid valves remain open for a period of time equal to said time cycle; and

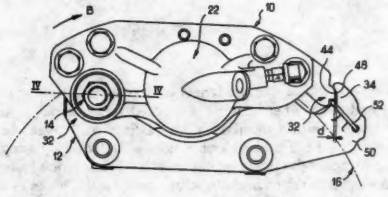
a pair of air nozzles positioned on opposite sides of said lubricant nozzles and adapted to remove dust and debris from the moving chain forward of said lubricant nozzles and to force the lubricant into the chain interfaces and to remove any excess lubricant dispersed from said lubricant nozzles.

4,630,713

DISC BRAKE WITH SLIDING CALIPER

Jean-Jacques Carre, Le Raincy; Alain Thioux, Chennevieres, and Jean-Claude Mery, Pavillons-sous-Bois, all of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Apr. 17, 1985, Ser. No. 724,144
Claims priority, application France, Apr. 26, 1984, 84 06585
Int. Cl.[4] F16D *55/224, 65/00*
U.S. Cl. 188—73.44 2 Claims



1. A disc brake of the type incorporating a caliper sliding on a fixed support by means of at least one axial pin lying parallel

to the rotational axis of a disc, a brake actuator acting directly upon an inner friction component and, by reaction through the caliper, upon an outer friction component, the friction components being tangentially offset on each side of a radial plane passing through the translational axis of the brake actuator, the inner friction component being anchored on the fixed support, the outer friction component being anchored on the caliper, the tangential offset of the friction components being such that during forward braking the caliper is subjected to a tangential force generated by the outer friction component, characterized in that the caliper includes a positioning device for positioning the caliper relative to the fixed support, the positioning device being progressive and dependent upon the tangential force over a predetermined range of the tangential force, the positioning device including the axial pin which has a progressively deformable componet which is progressively deformable under the effect of the tangential force that effects a circumferential movement of the caliper relative to the fixed support, the positioning device also including abutment means for limiting the circumferential movement to the predetermined range, the abutment means fixed firmly to the pin and limiting deformation of the progressively deformable component, the pin comprising an elastic sleeve positioned without play between concentric inner and outer tubes, the inner tube being fixed to the fixed support and the outer tube passing through a bore formed in the caliper, the caliper capable of sliding relative to the outer tube, and two rigid rings positioned with a radial clearance at ends of the tubes and between the tubes in order to limit the deformation of the elastic sleeve to a radial distance corresponding to a predetermined maximum movement of the caliper.

4,630,714

BLOCK BRAKE ACTUATOR FOR A RAIL VEHICLE

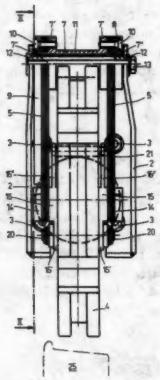
Olov G. Stjärne, Löddeköpinge; Lars M. Severinsson, Hishult, both of Sweden, and Alastair C. B. Lowrie, Darlington, England, assignors to Sab Nife AB, Landskrona, Sweden

Filed Dec. 6, 1984, Ser. No. 678,834

Claims priority, application Sweden, Dec. 21, 1983, 8307077

Int. Cl.[4] B61H *13/24*

U.S. Cl. 188—206 R **2 Claims**



1. For use with a flanged wheel set having a flange on each wheel and each wheel having a tapered tread, a rail vehicle brake system having a brake actuator affixed to the vehicle by a bracket having a brake block holder suspended by hangers for operation by the brake actuator on the brake block hangers by movement during a braking stroke causing the brake blocks to follow the axial wheel movement of the wheel set, a wheel taper compensating structure wherein said hangers are leaf springs pivoted to the bracket and brake block holder and movable with axial movement of the flanged wheel set, said leaf springs being prestressed in a direction toward the wheel flange prior to and subsequent with engagement with the tapered wheel tread and thus overcoming bias exertion on the brake block by the wheel taper tending to cause the brake block to move down the wheel taper because of the component force acting down the taper for compensating for the bias of the taper of the wheel tread over a range of axial movement of the wheel set.

4,630,715

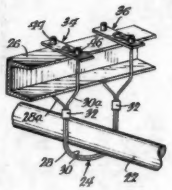
BOTTOM ROD SAFETY GUARD FOR RAILWAY BRAKE RIGGING

Frank P. Adler, Michigan City, Ind., assignor to Trans-Dyne, Incorporated, Chicago, Ill.

Filed Jun. 8, 1984, Ser. No. 618,919

Int. Cl.[4] B61H *13/34*

U.S. Cl. 188—210 **13 Claims**



1. A railway brake bottom rod safety guard adapted to hang from a supporting part of a railway vehicle, said safety guard compring a flexible elongate member, first and second pairs of flexible legs extending from opposite ends of said flexible member, a pair of plates adapted to rest on the upper surface of said supporting part in a spaced relation, and means for attaching said first and second pairs of flexible legs to the respective plates comprising means for securing one leg near one end of the plate, and means for releasably attaching the other leg near the other end of said plate to allow the flexible member and plate assembly to be installed and removed.

4,630,716

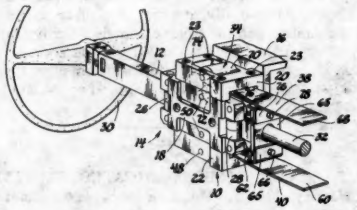
STRIP ROLL FORMING ENERGY ABSORBING DEVICE

Daniel P. Faust, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 3, 1985, Ser. No. 740,391

Int. Cl.[4] F16F *7/12*; B62D *1/18*

U.S. Cl. 188—371 **4 Claims**



1. An energy absorber unit comprising a stationary support member and a movable member, said movable member being mounted for linear stroking movement relative to said stationary member, said stationary member having a pair of fixed location rollers of predetermined diameter and spaced a predetermined distance from one another, shaft means associated with each of said rollers operatively mounting said rollers for turning movement with respect to said stationary member, a floating roller having an axis of rotation in a plane parallel to a

plane extending through said shaft means, said floating roller bearing disposed to one side of said pair of rollers having a diameter greater than the predetermined spacing between said rollers, an elongated strip of thin ductile material extending from a free end portion to a fixed end portion, securement means securing said fixed end portion of said strip to said movable member, and said strip leading from said securement means in a fixed path under one of said fixed rollers and around said floating roller and then over the other of said fixed rollers to said free end portion so that stroking of said movable member upon application of a predetermined load thereto pulls said strip and to instantaneously effect the radial displacement of said floating roller against said strip and toward a position between the fixed location rollers so that said strip is simultaneously bent with a predetermined and fixed radius and is worked to provide a predetermined resistive force to immediately retard said stroking movement and progressively absorb the energy of said load.

4,630,717

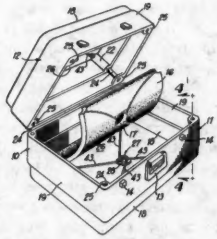
EXPANDABLE CARRYING CASE

Kun-Yuan Tong, 2308 W. Doublegate Dr., Albany, Ga. 31707

Continuation-in-part of Ser. No. 592,563, Mar. 23, 1984. This application Apr. 29, 1985, Ser. No. 728,081

Int. Cl.[4] A45C *7/00*

U.S. Cl. 190—104 **8 Claims**



1. A variable volume carrying case comprising a pair of hinged case sections each including telescoping relatively movable portions having stop means thereon to limit relative movement in one direction, a push-pull cable operating system for each carrying case section including a manually turnable and releasably lockable operator and four push-pull cable assemblies operatively connected between said operator and said portions, and including a housing on one of said portions with circumferentially spaced adjusting means for said operator for locking said portions in selected positions.

4,630,718

COUPLING CLUTCH/BRAKE AND HOUSING

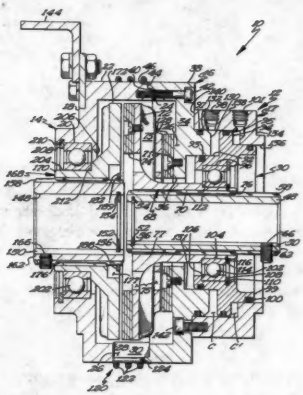
James V. Hanks, Robbinsdale, Minn., assignor to Horton Manufacturing Co., Inc., Minneapolis, Minn.

Filed Feb. 1, 1985, Ser. No. 697,495

Int. Cl.[4] F16D *67/04*

U.S. Cl. 192—18 A **17 Claims**

1. Coupling clutch/brake comprising, in combination: a first hub; a second hub; a first, driven interface disc having a first interface and a second interface; means for slidably mounting the first driven interface disc on the first hub; a second, drive interface disc, with the second, drive interface disc being selectively relatable with the first interface of the first, driven interface disc to rotatably relate the first, driven interface disc and the second, drive interface disc; means for slidably mounting the second, drive interface disc on the second hub; a first shell section; means for holding the first shell section in a stationary, non-rotating position, a second shell section; means for interconnecting the first shell section to the second shell section; means for rotatably mounting the second shell section on the second, drive interface disc; with the first shell section including a radially extending annular portion and an axially extending, annular flange extending from the first shell section in a direction opposite from the second shell section, with the annular flange including a radially inward axially extending surface and a radially outward axially extending surface; a third shell section including an open end having a size and shape complementary to and for receipt on the outward axially extending surface of the annular flange of the first shell section; a piston reciprocally mounted on the radially inward axially extending surface of the annular flange of the first shell section and on the third shell section; means for reciprocally relating the piston and the first, driven interface disc and for rotatably mounting the piston with respect to the first, driven interface disc; means for reciprocating the piston between a first axial position where the first interface of the first interface disc is



rotatably independent of the second interface disc and the second interface of the first interface disc rotatably relates with the radially extending annular portion of the first shell section and a second axial position where the first interface of the first, driven interface disc engages with the second interface disc and the second interface of the first interface disc is rotatably independent of the radially extending annular portion of the first shell section; wherein the piston and the shell sections have tolerances allowing the canting of the first, driven interface disc with respect to the first hub to take up horizontal misalignment of the first and second hubs and wherein the second, drive interface disc slidably mounting means allow canting of the second, drive interface disc with respect to the second hub to take up angular misalignment of the first and second hubs.

4,630,719

TORQUE AIDED PULSED IMPACT SHIFT MECHANISM

Daniel F. McCormick, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 13, 1985, Ser. No. 765,326

Int. Cl.[4] F16D *11/08, 23/12*

U.S. Cl. 192—21 **18 Claims**

1. A shift mechanism and clutch apparatus comprising:

a main axial shaft;

reverse gear means freely rotatable about said main shaft, said reverse gear means having a clutch face on one side;

forward gear means freely rotatable about said main shaft, said forward gear means having a clutch face on one side, with said clutch faces facing each other;

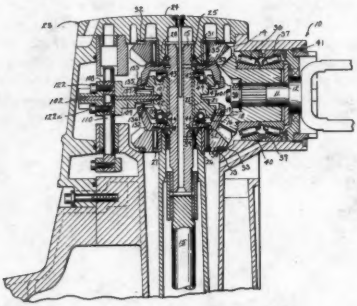
a drive gear meshed with said reverse and forward gear means for driving said reverse and forward gear means in respectively opposite directions of rota- tion;

a sleeve member mounted on said main shaft between said

reverse and forward gear means, said sleeve member having

a clutch face at each end, each clutch face selectively engageable with one of said clutch faces of said reverse and forward gear means, and

an exterior circumferential groove in said sleeve member between said clutch faces; yoke means for engaging said groove and moving said sleeve member axially;



cam means operatively associated with said yoke means; and actuating means for actuating said cam means into engagement with one of said gear means to actuate said yoke means and drive said sleeve member out of engagement with said one gear means and into engagement with the other of said gear means.

4,630,720

VEHICLE DRIVE ARRANGEMENT

Renato Boni, Carpi, Italy, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

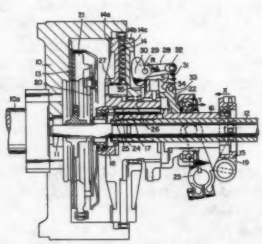
PCT No. PCT/EP84/00191, § 371 Date Feb. 11, 1985, § 102(e) Date Feb. 11, 1985, PCT Pub. No. WO85/00205, PCT Pub. Date Jan. 17, 1985

PCT Filed Jun. 25, 1984, Ser. No. 700,580

Claims priority, application United Kingdom, Jun. 28, 1983, 8317452

Int. Cl.[4] F16D *21/02*

U.S. Cl. 192—48.8 **7 Claims**



1. A vehicle drive arrangement having a drive shaft (10a), a first hollow driven shaft (12), a second driven shaft (11) rotatable within the first hollow driven shaft, first and second clutches (13, 14) co-axial with the driven shafts for coupling the drive shaft with the first and second driven shafts respectively, one (14) of said clutches being connected with its associated driven shaft via a central hub portion (24), and the other clutch (13) being operated by a plurality of operating members (17) which passes through corresponding apertures in the central hub portion and which are located outside both driven shafts.

4,630,721

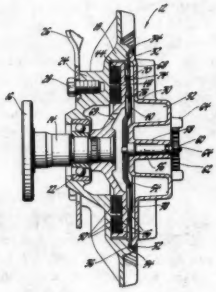
VISCOUS CLUTCH FOR ENGINE COOLING FAN

Gary L. Johnston, Pleasant Hill, and Harvey J. Lambert, West Milton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 5, 1984, Ser. No. 657,974

Int. Cl.[4] F16D *31/00*

U.S. Cl. 192—58 B **4 Claims**



1. A bladed fan and viscous clutch assembly for inducing a flow of air comprising an input shaft member adapted to be rotatably driven, clutch plate means rotatably driven by said shaft member, said clutch plate means having a rear face for shearing viscous fluid and having a front face, clutch body means housing said clutch plate means and having an inner viscous shear face axially spaced from said rear face of said clutch plate means to form a viscous fluid shear zone therebetween for receiving a shearable viscous clutch fluid so that said clutch body means can be driven by said clutch plate means through the shear of said fluid in said zone, fan blade means extending from said clutch body means, a cover plate attached to said clutch body means, a pump plate secured to said clutch body means and cooperating with said cover plate to form a reservoir for a quantity of fluid stored therein, said pump plate having pumping means associated therewith to pump fluid exiting from said shear space back to said reservoir, said reservoir being hydraulically separated from said clutch plate means by said pump plate, valve means associated with said pump plate to control the flow of fluid between said reservoir and said shear space, control means for operating said valve means, and fluid sealing ring means sealingly mounted between the interfacing surfaces of said pump plate and said front face of said clutch plate means to establish a discrete pump out cavity and to hydraulically block the interface between said pump plate and said clutch plate means so that substantially all the fluid exiting from said reservoir will be forced to flow through said shear zone and then to said pump out cavity for subsequent discharge by said pumping means on said pumping plate to said reservoir.

4,630,722

ELECTROMAGNETIC WRAP SPRING CLUTCH

Stephen Figueira, Penfield, and Philip A. Billings, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 29, 1982, Ser. No. 445,332

Int. Cl.[4] F16D *13/08, 27/10*

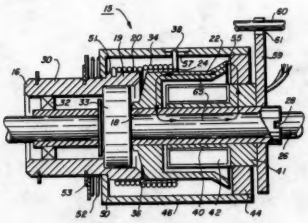
U.S. Cl. 192—84 T **2 Claims**

1. In an electromagnetically actuated wrap spring clutch having a cylindrical input clutching surface, an output clutching surface, a helical spring surrounding the surfaces and having one end secured to the input surface to rotate therewith, said input surface being adapted to impart rotation to the output clutching surface by virtue of frictional engagement of the spring upon the output surface, and an electromagnetic coil

being coaxial with the surfaces and the spring for selectively causing the frictional engagement, the improvement including:

a cylindrical control member surrounding the clutching surfaces and arranged to impart contracting of the helical spring when actuated for wrapping the same upon the output clutch surface,

an armature operatively associated with said control member,



said electromagnetic coil when energized produces a magnetic flux path which passes through said armature to cause the same to actuate said control member and thereby provide a driving connection between the input and output clutching surfaces, said electromagnetic coil having a diameter less than the diameter of the helical spring and the output clutching surface.

4,630,723

CENTRIFUGAL TYPE FRICTION CLUTCH

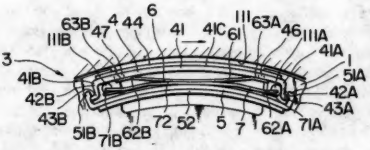
Shiro Sakakibara, Anjo, Japan, assignor to Aisin-Warner Limited, Anjo, Japan

Filed Sep. 20, 1984, Ser. No. 652,479

Claims priority, application Japan, Sep. 22, 1983, 58-175784

Int. Cl.⁴ F16D *43/14*

U.S. Cl. 192—105 BA **1 Claim**



1. A centrifugal type friction clutch which permits clutch slipping in both drive power transmission and driven power transmission modes, said clutch having a torque capacity in driven power transmission less than that in drive power transmision and comprising:

a drum having an interior cylindrical surface serving as a frictional coupling surface;

a disk coaxially mounted within said drum, said disk having a plurality of radial projections, said radial projections radially extending from the periphery of said disk and defining a plurality of peripheral notches therebetween, each of said radial projections having a pair of axially extending stop members mounted thereon;

a plurality of frictional coupling elements, one of said coupling elements mounted in each of said notches for radial movement therein, each of said frictional coupling elements comprising:

an arcuate portion with a friction surface for engaging said frictional coupling surface of said drum;

a pair of arms integral with said arcuate portion and extending radially inward from opposite ends of said arcuate portion, one of said arms engaging one of said radial projections in the driven power transmission mode, whereby the frictional coupling element becomes a trailing element;

a pair of grooves, one groove formed in each end of said frictional coupling element and extending into said arcuate portion, each of said grooves receiving an edge portion of an adjacent radial projection, the bottom of the groove extending through said one arm providing a point of contact with said disk in the drive power transmission mode, whereby the frictional coupling element becomes a leading element;

a plurality of weights, one of said weights mounted in each of said notches radially inward of said axially extending stop members and having arm portions extending circumferentially beyond said axially extending stop members so that the extent of the radially outward movement of the weight is limited by said axially extending stop members;

a plurality of resilient load elements, one of said resilient load elements mounted in each of said notches, said one resilient load element located between and urging apart one of said weights and one of said frictional coupling elements; and

a plurality of resilient retracting elements, each of said resilient retracting elements having end portions, each of said end portions engaging an axially extending stop member and having an intermediate portion engaging a weight so as to urge the weight radially inward.

4,630,724

METHOD AND DEVICE FOR FORMING A ROW OF FILTER-TIP CIGARETTES

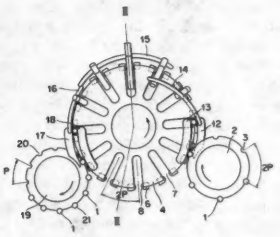
Motonobu Horie; Minoru Suzuki, both of Tokyo, and Shinji Ogura, Nagareyama, all of Japan, assignors to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 705,185

Claims priority, application Japan, May 2, 1984, 59-087775

Int. Cl.⁴ B65G *47/24*

U.S. Cl. 198—399 **6 Claims**



1. A method of forming a row of filter-tip cigarettes, said method comprising the steps of:

feeding a plurality of filter-tip cigarettes in two rows, cigarettes in each row having filters attached thereto extending in opposite direction, the cigarettes in one row being arranged in axial alignment with respect to the cigarettes in the other row;

providing a center support means for supporting cigarettes substantially about their centers of gravity;

supporting cigarettes in one of said rows substantially at their centers of gravity by said center support means, so that each cigarette so supported is rotatable about its center of gravity with respect to its respective center support means;

rotating said cigarettes supported by said center support means about their respective centers of gravity to invert said cigarettes;

moving the cigarettes in the other row forwardly with respect to a flow direction of said cigarettes to form two zig zag rows of said cigarettes, where said filters are attached to said cigarettes in the same direction and said two rows

of said cigarettes are arranged out of axial alignment with respect to each other; and

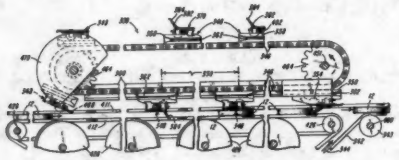
moving said cigarettes in said two zig zag rows in an axial direction to form one row of said cigarettes.

4,630,725

APPARATUS FOR ARRANGING ARTICLES IN A PREDETERMINED MANNER AND METHOD OF MAKING SAME

Karl H. Steurmer, New Richmond, Ohio, assignor to Planet Products, Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 292,741, Aug. 14, 1981, Pat. No. 4,421,222. This application Nov. 9, 1983, Ser. No. 550,180
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—425 16 Claims



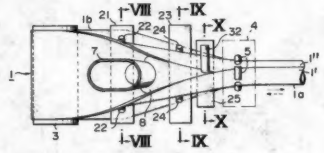
1. In an apparatus for arranging randomly oriented articles of roughly equal size in a predetermined pattern comprising; means for receiving said articles and disposing same in at least one substantially rectilinear row and in a single layer thereof; an accumulator for receiving said articles from said row; said accumulator having moving means for moving said articles therethrough and cooperating gate means for controlling the articles moved through said accumulator; said moving means and gate means being independently driven; and a collection device for collecting said articles from said accumulator; the improvement wherein said gate means comprises; a mechanism supported for movement in an endless path; said mechanism being disposed above at least a portion of said accumulator; a plurality of gates carried by said mechanism in spaced relation with a particular pitch between immediately adjacent gates establishing a predetermined number of said articles therebetween; means for serially indexing said mechanism a distance equal to said pitch to thereby move a gate disposed immediately adjacent said collection device and thus allow movement of the predetermined number of articles immediately upstream of said immediately adjacent gate out of said accumulator to said collection device; and a cam structure immediately upstream of said collection device, said cam structure being adapted to actuate each of said gates upon movement thereof thereagainst, each of said gates comprising means enabling movement of articles therepast and also providing a gating action upon being actuated by said cam structure or by a particular article, said gate action by a particular article being defined by the last article of said predetermined number of articles actuating the gate it has just moved past, said gating action serving to prevent movement past its associated gate of the next article upstream thereof, and said means for indexing said mechanism said distance equal to said pitch operating to move an exit gate engaged by said cam structure away therefrom and thereby allow movement of the predetermined number of articles immediately upstream of said exit gate out of said accumulator to said collection device.

4,630,726

TUBULAR BELT CONVEYOR AND A BELT ROLLING UP MEANS OF THE SAME

Kunio Hashimoto, Kitakyushu, Japan, assignor to Haruo Okazaki and Japan Pipe Conveyor Co., Ltd., both of Fukuoka, Japan

Filed May 3, 1984, Ser. No. 606,664
Int. Cl.[4] B65G *15/08*
U.S. Cl. 198—819 1 Claim



1. A tubular belt conveyor having a belt pressing device comprising:

an endless belt able to be rolled to form an overlapped tubular shape;

a plurality of spaced apart supporting frames each of which is disposed to surround outgoing and returning paths of said endless belt;

a plurality of closely spaced belt shape maintaining rollers which are arranged to configure substantially a circle inside each of said supporting frames;

and a belt pressing roller, disposed adjacent a conveyor loading station at one end of said conveyor between said station and the nearest supporting frame which pressedly bends one side end portion of said endless belt horizontally inwardly, and beneath the other side end portion, said belt pressing roller reduces frictional contact between said one side end portion and said other side end portion as the side end portions move laterally relative to each other during formation of the overlap by being positioned between said one side end portion and said other side end portion where said endless belt is to be rolled horizontally into said overlapped tubular shape; wherein said belt pressing roller is adjustable laterally of the belt and vertically, said belt pressing roller extends in a substantially horizontal direction laterally of the belt over said outgoing path of said endless belt on an upper side of the belt and a receptacle is provided to receive the materials carried adjacent the end of the outgoing path.

4,630,727

CONTAINER FOR A BICARBONATE CONTAINING FLUID

Mariano Feriani, Arcugnano, and Stefano Biasioli, Vicenza, both of Italy, assignors to Fresenius, AG, Fed. Rep. of Germany

Filed Apr. 4, 1985, Ser. No. 719,903
Claims priority, application Italy, Apr. 6, 1984, 85554 A/84
Int. Cl.[4] B65D *81/32*
U.S. Cl. 206—221 19 Claims

1. A container for preparing a bicarbonate-containing solution for dialysis, substitution or infusion for peritoneal dialysis, hemo filtration and the like comprising:

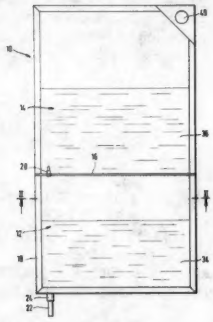
(a) an outer bag structure of organic polymer having at least two chambers,

(b) a first of said chambers filled with an aqueous solution containing carbonate,

(c) a second of said chambers filled with an aqueous acid solution,

(d) an openable flow blocking valve connecting said first

with said second chamber, said valve being the sole ingress or egress means to said second chamber, and



(e) at least one discharge tube fitted with a removable closure, said discharge tube passing through and being sealed to said outer bag and into a said first chamber.

4,630,728

DISC CARTRIDGE

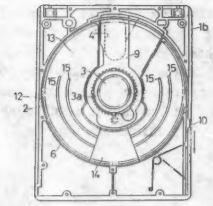
Fujio Matsumoto, and Yoshitake Kato, both of Ibaragi, Japan, assignors to Hitachi Maxwell, Ltd., Osaka, Japan

Filed Sep. 5, 1984, Ser. No. 647,524

Claims priority, application Japan, Sep. 7, 1983, 58-139344[U]

Int. Cl.⁴ B65D *85/57*

U.S. Cl. 206—313 **7 Claims**



1. A disc cartridge comprising:

a disc case having an upper half and a lower half;

said disc case including at least one drive shaft insertion hole on a central portion thereof and at least one magnetic head insertion hole, each half having an inner and outer surface;

a disc rotatably mounted therein;

ribs, arcuately shaped and provided on said inner surface of each half of said disc case and located to generally surround approximately half or greater of the perimeter of said drive shaft insertion hole, and

liners, laid on respective inner surfaces of each of the halves of said disc case, and being positioned between said ribs and said disc, for slidably contacting both surfaces of said disc.

4,630,729

PACKAGE, FOR EXAMPLE, FOR SURGICAL INSTRUMENTS AND PRODUCTS

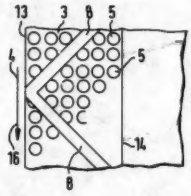
Edmund Hirt, Stuttgart; Dietmar Send, Memmingen, and Günter Diete, Buchenberg, all of Fed. Rep. of Germany, assignors to Firma Dixie Union Verpackungen GmbH, Kempten, Fed. Rep. of Germany

Filed Jul. 12, 1985, Ser. No. 754,274

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1984, 3427702

Int. Cl.⁴ B65D *43/02, 81/18*

U.S. Cl. 206—363 **7 Claims**



1. A packaging device for use with products to be sterilized such as surgical instruments and products and the like, comprising: a first sheet of plastics material and a second sheet of flexible material; said second sheet being composed of paper-like material which is composed of single fibers; said first sheet and said second sheet having corresponding marginal portions; said marginal portions of said first and second sheets of material being joined together; a body; said body having a cavity adapted to contain a product; said first sheet being connected to said body adjacent said cavity; said cavity being closed by said second sheet; said second sheet being adapted to permit permeation of a gas therethrough; said marginal portions which are joined together comprising a joined region; said cavity being bounded by said joined region; at least a portion of said second sheet projecting beyond said joined region to facilitate an opening operation by peeling said joined region apart;

said first sheet and said second sheet having respective confronting surfaces at said joined region; there being disposed upon at least one of said confronting surfaces a first group of bonding elements and a second group of bonding elements; individual elements of said first group each being of a first, small, dimension in at least one direction in a plane of said joined region; individual elements of said second group comprising a narrow elongated line of bonding; each of said individual elements of said second group being disposed generally transversely to a predetermined direction of peeling for an opening operation; whereby said first group of bonding elements is so constructed as to permit separation of said first and second sheets of said joined region readily without substantial pulling out of fibers from said second sheet; and whereby said second group of bonding elements is so constructed as to provide a stronger bond than does said first group of bonding elements, and whereby fibers pulled out from said second sheet by said second group of elements during separation of said joined region are retained by said individual elements of said second group to avoid contamination of the product.

4,630,730

KNITTING PROJECT WORKBOX

Patricia J. Storey, 1502 E. Mission, Escondido, Calif. 92025

Filed Mar. 31, 1986, Ser. No. 846,155

Int. Cl.⁴ B65D *85/66*

U.S. Cl. 206—392 **7 Claims**

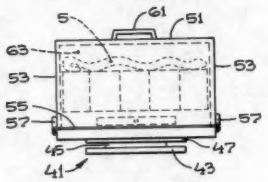
1. A workbox for a knitting project, comprising:

(a) a plurality of fully enclosed small containers, in which to

store different yarns needed as source yarns in the project, said containers assembled in tangential geometry so that their tops lie in a common plane;

(b) each said container having a hinged loading door and an aperture through which a strand of yarn may pass from storage to the knitting project for incorporation therein;

(c) a swivel stand supporting said assembled containers to permit rotation thereof in phase with rotation by the knitter of the knitting project;



(d) a cover for placement over said containers comprising a top plate spaced above said containers, creating a space therebetween for storage of the knitting project therein, enclosing sides depending from said plate around the outside of said storage boxes to encase said knit project storage area and containers therein, means for temporarily fastening said cover to said assembled containers; and,

(e) a handle atop said cover for transporting said workbox.

4,630,731

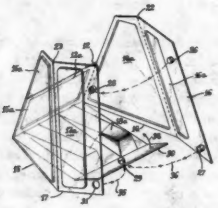
BROCHURE HOLDER AND BLANK THEREFOR

Lewis L. Albery, Dolton, Ill., assignor to The Cooperative Marketing Co., Elk Grove Village, Ill.

Filed Feb. 8, 1985, Ser. No. 699,815

Int. Cl.⁴ B65D *37/00*

U.S. Cl. 206—425 **12 Claims**



1. A substantially flat, preformed one-piece plastic blank for assembling into a holder for brochures and the like comprising, in combination, a substantially rectangular front panel;

a first side panel adjoining the front panel on one side thereof;

a second side panel adjoining the front panel on the other side thereof;

said side panels each having a rear edge oriented at an acute angle to a bottom edge,

a first substantially rectangular back panel adjoining the rear edge of the first side panel;

a second substantially rectangular back panel adjoining the rear edge of the second side panel, the first and second back panels being inclined forwardly from bottom to top when the holder is assembled as a result of the orientation of the rear edges of said side panels;

a bottom panel adjoining said front panel, the bottom panel having a surface formed therein inclined upwardly from front to back so that, when the holder is assembled, any brochures held therein will slide toward the front of the holder and having a flap hinged to its rear edge; and

integral interfitting and frictionally engaging means on said bottom panel flap and said back panels for securing together the holder in its assembled condition which permit said blank to be shipped in a substantially flat condition and assembled without the use of tools or adhesives.

4,630,732

STORAGE DEVICE FOR STORING DISC-SHAPED ARTICLES

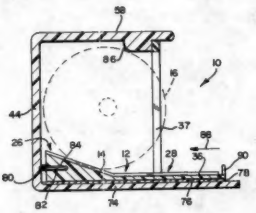
Robert Snyman, 1180 Pretorius Street, Hatfield, Pretoria, Transvaal Province, South Africa

Filed Aug. 26, 1985, Ser. No. 769,574

Claims priority, application South Africa, Sep. 6, 1984, 84/7013

Int. Cl.⁴ A47B *81/06*

U.S. Cl. 206—445 **6 Claims**



1. A storage device for storing a plurality of disc-shaped articles in closely spaced vertical side-by-side relationship which includes

a floor and a rear wall extending upwardly from the floor; a plurality of supports, each being slidably mounted on the floor, one support being provided for each article to be stored, each support having a support surface for supporting the articles, and including first bias means for biasing the articles towards rolling; and

releasable restraining means associated with each support to restrain the articles against rolling under the effect of the first bias means, each restraining means including second bias means to bias its associated support away from the rear wall or the device, and a shoulder at an upper portion of the front of the device against which a part of the periphery of the article abuts in use.

4,630,733

PRODUCT INDICATING TAB

Robert E. Fear, Wheaton, Ill., assignor to Continental Bondware, Inc., Rolling Meadows, Ill.

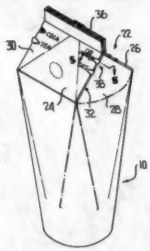
Filed Dec. 20, 1985, Ser. No. 811,366

Int. Cl.⁴ B65D *73/00*

U.S. Cl. 206—459 **11 Claims**

1. A carton formed of a laminate including a core formed of a readily delaminatable material and separate inner and outer surface layers, said carton having at least one corner whereat said laminate is generally reversely folded, at least one product identifying tab formed at said corner by a cut line through said outer surface layer and terminating in said core, said product identifying tab having a starting end extending partially around

said corner, and product identifying indicia on said carton adjacent said tab, said tab starting end being rounded to effect



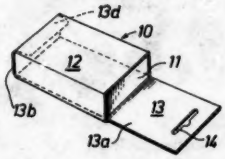
automatic separation of said tab starting end from said laminate when said laminate is folded to form said corner.

4,630,734

PACKAGE FOR HANGING OR STAND-UP DISPLAY

Eric Severin; Arne Jansson, and Kjell Östman, all of Jönköping, Sweden, assignors to AB Jönköping Vulcan, Sweden

Filed Mar. 21, 1985, Ser. No. 714,252
Claims priority, application Sweden, Mar. 30, 1984, 84017748
Int. Cl.[4] B65D 6/06
U.S. Cl. 206—461 12 Claims



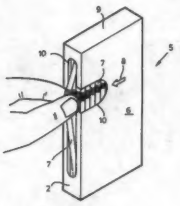
1. A package comprising an inner box having a predetermined length, an outer box including an entrance aperture, an exit aperture, and a pathway of at least said predetermined length extending therebetween, whereby said inner box can move slidably along said pathway between an open position in which said inner box is only partially contained within said pathway and a closed position in which said inner box is contained entirely within said pathway, and insert means insertable into said pathway, said insert means having a length greater than said predetermined length whereby when said insert means is inserted within said pathway between said inner and outer boxes said insert means can extend for substantially said entire predetermined length and an extended portion of said insert means extends beyond said outer box, whereby said package may be mounted on a support affixed to said extended portion of said insert means, said insert means further including fixation means for removably maintaining a relatively fixed relationship between said outer box and said insert means when said insert means is inserted within said pathway while simultaneously permitting said inner box to be freely slidable along said pathway from said closed position to said open position.

4,630,735

DISPENSER CARTON FOR DRINKING STRAWS WITH TEAR-OUT DISPENSING OPENING

Klaus Jebens, No. 67, Sasselheider Strasse, 2000 Hamburg 72, Fed. Rep. of Germany

Filed Dec. 10, 1985, Ser. No. 807,151
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1984, 3445927
Int. Cl.[4] B65D 5/54
U.S. Cl. 206—611 2 Claims



1. A drinking straw dispenser assembly comprising a dispenser carton containing a group of a plurality of drinking straws of predetermined length and arranged in contiguous, parallel, coextensive relationship; said carton comprising rectangular front and rear walls spaced from each other and having opposite side edges and opposite end edges extending between said opposite side edges; two side walls extending between respective opposite side edges of said front and rear walls, opposite ends of said side walls being in substantial alignment with said opposite end edges of said front and rear walls; and two end walls extending between respective opposite end edges of said front and rear walls and respective ends of said side walls to confine said group of straws within said container; said front wall and one of the adjoining side walls having a tear-out portion defined by a pattern of perforations and comprising a first section in said one side wall which extends in a narrow elongated configuration along a substantial length of said one side wall intermediate the opposite ends thereof, providing portions of said one side wall between opposite ends of said first section of said tear-out portion and the respective ends of said one side wall, the length of said first section of said tear-out portion being less than said predetermined length of said plurality of straws; and a second section which extends laterally from one side of said first section in said one side wall to the junction of said one side wall with the respective side edge of said front wall and from said respective side edge in said front wall for a substantial distance toward the opposite side edge thereof, the width of said second section being substantially less than the length of said first section and said second section being intermediate the opposite ends of said one side wall and the opposite end edges of said front wall; whereby, upon removal of said tear-out portion from said one side and front walls, thereby forming a drinking straw dispensing orifice having an elongated first section in said one side wall and a lateral second section in said one side and front walls, said plurality of drinking straws is retained in said carton by said portions of said one side wall between opposite ends of said first section of said orifice and the respective ends of the said one side wall and individual straws are dispensed from said carton by gripping through said orifice the opposite sides of one of said plurality of straws in said carton intermediate the opposite ends of said one straw and laterally withdrawing said one straw through said first section of said orifice in said one side of said carton without contacting and contaminating the opposite ends of said one straw.

4,630,736

SORTING MACHINE UTILIZING AN IMPROVED LIGHT DETECTION SYSTEM

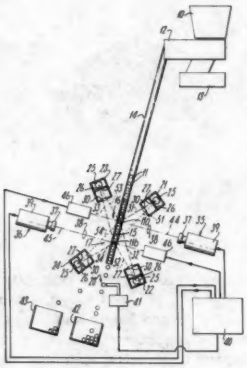
William S. Maughan, West Sussex, and Herbert Fraenkel, London, both of England, assignors to Sortex Limited, London, England

Filed Jun. 15, 1984, Ser. No. 621,253

Claims priority, application United Kingdom, Jun. 30, 1983, 8317777

Int. Cl.[4] B07C 5/342

U.S. Cl. 209—587 25 Claims



1. A sorting machine comprising:

means for moving a plurality of objects sequentially past a plurality of viewing zones which are spaced apart in the direction of movement of the objects so that the moving objects pass to an object separation zone in which relative separation is effected between desired and undesired objects;

light sources on opposite sides of said moving objects, each light source directing first and second beams of light to different viewing zones respectively;

viewing means for effecting viewing from opposite sides of the objects passing through the viewing zones, each of said first beams being out of alignment with any viewing means on either side of the moving objects, and each of said second beams being directed to a viewing zone different to that illuminated by the respective first beams and being less powerful than the latter;

discriminator means, controlled by the output from said viewing means, for determining whether objects which have been so viewed are desired or undesired; and

object separation means, controlled by said discriminator means, for effecting relative separation in the object separation zone between said desired and undesired objects, at least most of the light which is reflected by an object so as to be directed into a viewing means being derived from a light source disposed on the same side of said moving objects as the respective viewing means.

4,630,737

SPACER CLIP

Ronald R. King, Sutton, Mass., assignor to Wright Line, Inc., Worcester, Mass.

Filed Mar. 13, 1986, Ser. No. 839,698

Int. Cl.[4] A47G 29/00

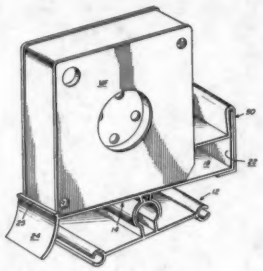
U.S. Cl. 211—40 10 Claims

3. A spacer clip attached to a cell for storing and dispensing cartridges, the clip comprising:

an upstanding back member,

a front member spaced from and substantially parallel to the back member,

a bridge joining the upper ends of the front and back members,



a removable cartridge engaging member projecting from the lower end of the front member in a direction away from the back member.

4,630,738

RACK FOR STORING NUCLEAR FUEL ELEMENTS

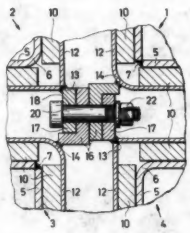
Ernst Bosshard, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 17, 1983, Ser. No. 552,746

Claims priority, application Switzerland, Nov. 17, 1982, 6692/82

Int. Cl.[4] A47F 7/00

U.S. Cl. 211—60.1 11 Claims



1. A rack for storing nuclear fuel elements comprising

a baseplate;

a plurality of parallel neutron-absorbent square tubes secured to said baseplate in upright manner;

a plurality of connectors secured to said tubes for laterally supporting said tubes, each said connector being secured to a respective corner of a respective tube and disposed in lateral contact with a connector of at least one adjacent tube at least in a central plane between adjacent tubes; and

tightening means for drawing said contacting connectors laterally against one another.

4,630,739

STATIONERY RACK CONSTRUCTION

Nat Levenberg, Lynbrook, N.Y., assignor to Jefsteel Business Equipment Corp., Brooklyn, N.Y.

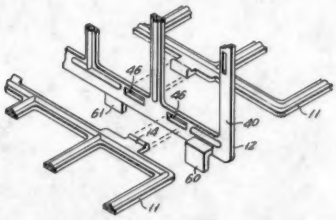
Filed Oct. 10, 1985, Ser. No. 786,224

Int. Cl.[4] A47F 5/00

U.S. Cl. 211—189 4 Claims

1. Stationery rack construction comprising: a first plurality of floor members of generally planar configuration, a second plurality of side wall members of generally planar rectangular configuration, and a third plurality of rear wall members of generally planar rectangular configuration; said first, second

and third pluralities being formed of moulded synthetic resinous material and having a limited degree of resiliency; said first plurality of floor members having a pair of opposed side edges having planar laterally projecting tabs thereon in mutually non-symmetrical relation, said second plurality of side wall members having plural sets of first and second slots at correspondingly disposed locations so as to be selectively engage-



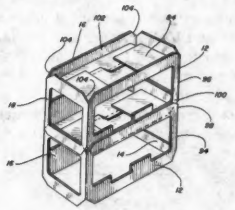
able with projections on said first plurality of floor members on one side thereof in said first slots, and on the oppositely disposed sides thereof by projections in said second slots thereof; whereby a number of members of said first plurality of floor members may be engaged upon either side of a single member of said second plurality of side wall members, enabling said single member to serve selectively as an end wall or a medially disposed wall of said rack construction.

4,630,740

MODULAR DISPLAY STAND

Paul Belokin, Jr., P.O. Box 1907, Denton, Tex. 76201

Filed Oct. 1, 1984, Ser. No. 656,361
Int. Cl.[4] A47F *43/00*
U.S. Cl. 211—194 **2 Claims**



1. A collapsible display module comprising:

a wall blank having substantially flat wall panels connected end to end foldably relative to each other to define a continuous wall structure,

said wall blank collapsible to a flattened state for storage and convertible to an expanded display state in which pairs of opposed, facing panels cooperatively bound a display space;

at least one flap associated with each of the wall panels of one said wall panel pair, said flaps each comprising a body and at least one tooth extending from the body; and

means attaching the body of each said flap foldably relative to its respective wall panel so that said flaps can be situated in meshed, overlapping relation with each other with said blank in the display state without distorting the panels or the flaps, wherein the tooth on each flap overlies the body of the flap on the opposed panel,

the extension of one of the bodies from its respective wall panel being greater than the extension of the other of the bodies from its respective wall panel so that a resulting opening in the wall blank from the flap with the one body is larger than an opening in the wall blank from the flap with the the other body,

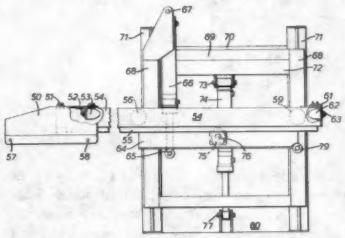
said flaps serving as shelves for placement of articles to be displayed and the panel with the flap with the other body has a larger retaining surface for articles on the shelf.

4,630,741

EXTENDIBLE BOOM INCLUDING A RACK AND PINION MECHANISM

Alec M. Stevens, P.O. Box 329, Atherton, Queensland 4883, Australia

PCT No. PCT/AU84/00047, § 371 Date Nov. 20, 1984, § 102(e) Date Nov. 20, 1984, PCT Pub. No. WO84/03603, PCT Pub. Date Sep. 27, 1984
PCT Filed Mar. 20, 1984, Ser. No. 678,554
Claims priority, application Australia, Mar. 22, 1983, PF8551
Int. Cl.[4] B66C *23/56*
U.S. Cl. 212—203 **9 Claims**

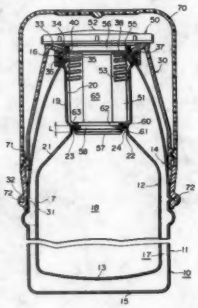


1. An extendible boom comprising an elongated work head carrying arm mounted on a supporting means therefor which enables reciprocating movement of said elongated arm in a generally horizontal direction along the length thereof, a source of motive power for application to said elongated work head carrying arm to move said elongated arm back and forth, a rack and pinion mechanism for coupling said source of motive power to said elongated arm wherein said rack extends along the length of said elongated arm and said pinion is connected to said source of motive power, said elongated arm being a hollow channel section which is rectangular in cross section and is closed on all its sides but the lower having a lengthwise extending slot through the lower side thereof, said supporting means having a plate-like member passed through said slot for supporting a bearing assembly comprising two roller pairs disposed on axles supported by the plate-like member, said roller pairs engaging with inner surfaces of the upper and lower sides of said hollow channel section to locate and guide said channel for lengthwise movement on said roller pairs, said rack being dispoesd along the underside of the elongated arm and said pinion and source of motive power being mounted to said plate-like member beneath said elongated arm, said rack being fixed at each end to opposite ends of said elongated arm, a resilient bumper means being provided at each rack end to engage with an end stop at the extent of each of the extending and retracting movements, one of said rack ends being interconnected with a rack tension adjusting mechanism comprising a tapped, sliding block attached to said rack end, a housing to prevent twisting of said sliding block and a screw bolt which engages said tapped block whereby the rack tension is adjusted.

4,630,742
CONTAINER AND PLUG ASSEMBLY

Kenichi Miyaji; Shouji Toida; Seiichi Ito; Isao Watanabe, and Masatoshi Kishida, all of Yoshidamachi, Japan, assignors to Nippon Sanso Kabushiki Kaisha, Japan

Filed May 28, 1985, Ser. No. 738,652
Claims priority, application Japan, May 31, 1984, 59-80527
Int. Cl.[4] B65D *25/18*
U.S. Cl. 215—13 R 18 Claims

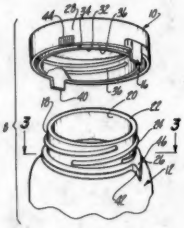


1. A container and plug assembly comprising; an elongated container having a closed longitudinal one end and the other longitudinal end, said container having a receiving space defined at the longitudinal one end for receiving therein contents, an opening defined at the other longitudinal end, the contents being filled into said receiving space and discharged therefrom through said opening, and an annular ridge formed at a location spaced from said opening toward said receiving space a predetermined distance, said annular ridge defining a throat having a diameter less than that of said opening, said receiving space being in communication with said opening through said throat, said ridge having a circumferentially continuous sealing surface extending substantially longitudinally of said container a predetermined distance, a plug having one and the other axial ends and threadedly engageable with said container so as to open and close said opening by the axial one end of said plug, said plug having annular resilient sealing means carried on the other axial end of said plug, said sealing means carried on the other axial end of said plug being in sealing contact with said sealing surface with said opening of said container being closed by the axial one end of said plug threadedly engaged with said container, a circumferentially continuous second sealing surface formed on said container adjacent to said opening and said second sealing means carried on said plug adjacent to the one axial end thereof, the first-mentioned sealing means being in sealing contact with the first-mentioned sealing surface with said second sealing means being in sealing contact with said second sealing surface to close said opening, the first-mentioned sealing means comprises an annular body fitted in the other axial end of said plug and an annular projection extending radially outwardly from said annular body and having an annular free end in intimate contact with the first-mentioned sealing surface such that said first-mentioned sealing means is subjected only to a force directed substantially radially inwardly from the first-mentioned sealing surface with said second sealing means being in sealing contact with said second sealing surface to close said opening.

4,630,743
TAMPER INDICATING CHILD RESISTANT CLOSURE

David M. Wright, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Oct. 1, 1984, Ser. No. 656,472
Int. Cl.[3] B65D *55/02*
U.S. Cl. 215—216 17 Claims

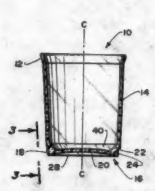


1. A tamper indicating and child resistant package including a threaded closure and a container having a threaded neck to receive said closure, said package comprising: a lock member on said container, a closure having a top with concentric inner and outer walls depending from said top, said inner wall having threads engageable with said threaded neck on said container, a lock element on said outer wall for engaging said lock member upon opening rotation of said closure to prevent rotation beyond a predetermined point, said lock element being deflectable radially outwardly upon radial inward squeezing of said outer wall at diametrically opposed points to permit said lock element to pass said lock member and permit opening rotation of said closure, a tamper indicating element on said outer wall for engaging said lock member to prevent rotation of said closure in an opening direction, said tamper indicating element being frangible relative to said outer wall for removal from said closure to permit rotational movement of said closure relative to said lock member and to indicate tampering, and means connecting said tamper indicating element to said inner wall to prevent radial outward deflection of said lock element upon squeezing of said outer wall at said diametrically opposed points to prevent rotation and maintain said closure on said container until removal of said tamper indicating element.

4,630,744
CONTAINER WITH REGISTRATION RIB

Edgar F. Trombly, Grosse Pointe Farms, Mich., assignor to Thermo-Serv, Inc., Anoka, Minn.

Filed Sep. 3, 1985, Ser. No. 771,775
Int. Cl.[4] B65D *21/02*
U.S. Cl. 220—1 R 4 Claims



1. A container having a base from which extends a sidewall with a lower portion comprising an annular shoulder defining an inner corner from which an offset sidewall extends downwardly to a lower end defining the outer periphery of said container base, said offset sidewall including a single elongated rib exterior member extending from said inner corner down-

wardly to a terminus proximate said lower end with the longitudinal axis thereof coextensive with the rotational axis of said container wherein the lower portion interior of said container comprises an annular inclined surface intersecting and extending inwardly from the container sidewall to said base forming a thickened region about the base periphery.

4,630,745
FOLDABLE CONTAINERS

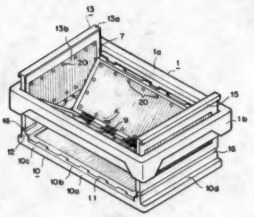
Yosuke Shiotani, Komaki, Japan, assignor to Kunimori Kagaku Co., Ltd., Aichi, Japan

Filed Mar. 13, 1985, Ser. No. 711,412

Claims priority, application Japan, Apr. 13, 1984, 59-55337[U]; Sep. 5, 1984, 59-135293[U]; Nov. 22, 1984, 59-177964[U]

Int. Cl.⁴ B65D *6/18, 6/26*

U.S. Cl. 220—6 **5 Claims**



1. A foldable container, comprising:

an upper rectangular frame wherein said frame is provided with a pair of flanges on one pair of opposed inner sides and upwardly bent edges on the remaining pair of opposed inner sides;

a rectangular bottom plate having studs insertable into opposing sides of said upper frame;

a pair of side plates, the upper end of each of said side plates being rotatably connected to a corresponding flange of said upper frame, and the lower end of each side plate being detachably engageable with said bottom plate;

wherein each side plate is provided with a plurality of openings at the lower side thereof, and said bottom plate is provided with a plurality of inwardly protruded bosses to be inserted through said openings of each side plate; and

a pair of end plates, the upper end of each of said end plates being detachably engageable with said frame and the lower end of each end plate being detachably engageable with said studs of said bottom plate;

wherein each side of said end plate is fit into a spacing between side edges of said flanges and an adjacent inner side surface of said frame, and each end plate is provided with a downwardly bent edge at the upper end thereof to be engageable with said bent edge of the frame.

4,630,746
COLLAPSIBLE STACKABLE SHIPPING CONTAINER

Jerry B. Fortenberry, Northville, Mich., assignor to Fortenberry & Associates, Inc., Northville, Mich.

Filed Feb. 27, 1984, Ser. No. 584,091

Int. Cl.⁴ B65D *7/24*

U.S. Cl. 220—6 **18 Claims**

1. A collapsible stackable lightweight shipping container having an open top comprising front and rear walls;

opposed sectional end walls, each end wall including a pair of aligned end wall sections pivotally interconnected along their inner adjacent upright edges and a their outer upright edges pivotally connected to opposite side edges of said front and rear walls respectively;

a corner member of L-shape configuration located upon and along the outer upright edges of said front and rear walls, each corner member forming a part of the front or rear wall to which it is connected and extending inwardly at right angles thereto;

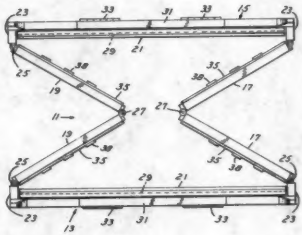
a pair of aligned bottom walls at their outer edges pivotally connected to bottom edges of said front and rear walls respectively and at their opposite sides supported upon said end walls respectively;

said bottom walls adapted for upward pivoting into engagement with said front and rear walls respectively;

said end wall sections adapted for inward pivotal movement into parallel engagement with each other and with the front and rear walls and the lifted bottom walls;

said bottom walls being enclosed by the corresponding corner members when collapsed to facilitate inward folding and collapsing of said end wall sections;

said front, rear and bottom walls and said end wall sections being made from molded plastic material and having inner and outer surfaces;



each wall and section including a plurality of spaced right angularly related ribs defining an open mesh construction between the inner and outer surfaces throughout substantially the entire area of each wall and section;

said front wall having a central rectangular opening adjacent its upper edge;

an upright front wall access section made from molded plastic material and having inner and outer surfaces, said section being nested within said opening coplanar with said front wall, along its lower edge pivotally connected to said front wall;

said front access section including a plurality of spaced right angularly related ribs defining an open mesh construction between the inner and outer surfaces thereof; and

opposed outwardly directed latch means slidably mounted upon upper side portions of said access section aligned with and retainingly engageable with corresponding detents said front wall.

4,630,747
GRAVITATIONALLY-OPERATING COLLAPSIBLE BASKET

Ming-Yao Chiang, and Pei-Leh Chiang, both of P.O. Box 10160, Taipei, Taiwan

Filed Apr. 30, 1986, Ser. No. 857,482

Int. Cl.⁴ B65D *6/18*

U.S. Cl. 220—7 **2 Claims**

1. A gravitationally-operating collapsible basket comprising:

an upper frame having two side fencing elements, a rear and a front fencing element to form a rectangular or square frame;

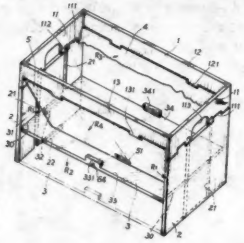
two side plates, each pivotedly mounted on each said fencing element by a hinge and each side plate formed with two longitudinal grooves, corresponding to two short grooves formed on each said side fencing element of said upper frame, and each formed with an extension key on its inner bottom edge;

a bottom plate including two pairs of extensions formed on the two side edges thereof and each pair of extensions respectively engaged with every two longitudinal grooves

formed on each side plate, two grooves formed on two side bottom edges each groove operatively engaged with each said extension key of side plate, an extension key formed on the front edge, and another extension key formed on the rear edge;

a rear plate pivotedly mounted on said rear fencing element by a hinge and formed with a groove on its bottom edge to operatively engage with said extension key formed on the rear edge of said bottom plate; and

a front plate pivotedly mounted on said front fencing element by a hinge and formed with a groove on its bottom edge to operatively engage with said extension key formed on the front edge of said bottom plate;



said height of each said side fencing element of said upper frame being larger than the height of said rear or front fencing element such that the difference of said two heights is equal to the sum of thickness of all said plates as folded by the order of the uppermost rear and front plates, middle bottom plate and the lowest two side plates, as horizontally stacked;

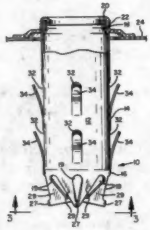
whereby upon the releasing of said two side plates, said bottom plate will gravitationally descend along said two side plates, and the rear and front plates will then angularly move to be pendant to assemble a cubic or parallelepiped basket; and upon the reversing of the assembled basket, all plates will be gravitationally collapsed to become a folded compact unit.

4,630,748

ANTI-SIPHON FUEL FILLER ASSEMBLY

Russell D. Keller, 149 N. Lotus Beach Dr., Portland, Oreg. 97217

Filed Aug. 7, 1985, Ser. No. 763,475
Int. Cl.[4] B65D *25/02*
U.S. Cl. 220—86 AT **24 Claims**



1. An anti-siphon fuel filler assembly for placement in a fuel tank comprising:

tube means adapted to be positioned in said fuel tank for allowing fuel to flow therethrough into said tank;

restriction means in said tube means for preventing the insertion of a siphon hose into said tank;

a plurality of openings in the side walls of said tube means; and

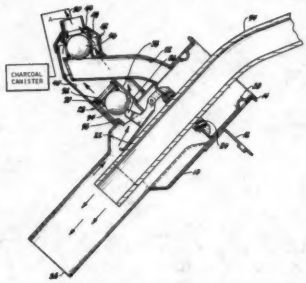
deflection means for outwardly directing any reverse flow of fuel in said tube means, said deflection means including a plurality of tabs, each tab being positioned adjacent one of said openings, and projecting outwardly therefrom.

4,630,749

FUEL FILL TUBE WITH VAPOR VENT AND OVERFILL PROTECTION

Donald J. Armstrong, Troy; Roy A. Giacomazzi, Washington Township, Macomb County, and George W. Niepoth, Milford, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 18, 1986, Ser. No. 840,871
Int. Cl.[4] B65D *31/06*
U.S. Cl. 220—86 R **3 Claims**



1. A fuel tank fill tube for a vehicle having a fuel tank and a vapor storage canister; said fill tube comprising: an open end adapted to be closed with a fuel cap; a spring closed flap means adjacent said open end for closing said open end from said fuel tank when a cap is installed and being opened by a fuel fill nozzle when refueling of the tank is undertaken, said flap means including a finger portion; spring loaded shut-off means disposed in said fill tube for closing said tube from said canister and being opened by abutment of said finger portion when said flap means is opened; and float valve means for permitting passage of vapor from said tube passing through said shut-off valve to said canister and preventing liquid from flowing to said canister and including overflow means for directing liquid flowing through said shut-off valve to the open end of said fill tube.

4,630,750

CONTAINER CAM LOCK

Joel Hughes, Wilmington, N.C., assignor to Container Products Corp., Wilmington, N.C.

Filed Jan. 22, 1986, Ser. No. 821,038
Int. Cl.[4] B65D *45/16*
U.S. Cl. 220—324 **8 Claims**

1. A locking assembly between a removable lid and a four sided, open top waste container, comprising,

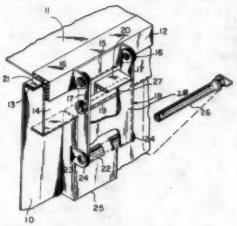
(a) a rotatable latch assembly carried by the lid to be locked upon the open top of the container,

(b) means for hingedly mounting said latch assembly to the lid for movement from a plane parallel to the lid into a plane perpendicular to the lid and parallel to the side of the container,

(c) said latch assembly including a latch lever rotatable therewith into and out of a latching position,

(d) latch means provided by the container and in the path of movement of said latch lever as it is rotated with said latch assembly into contact therewith as said assembly is rotated perpendicular to the lid and parallel to the side of the container so as to secure the lid upon the container, and

(e) means for releasably locking said latch lever in contact with said latch means contacted thereby for preventing rotatable movement of said latch lever out of a lid locking position.



4,630,751

CLOSURE MECHANISM

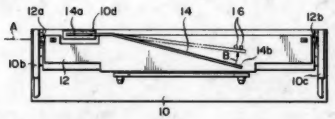
Asao Saito, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1986, Ser. No. 841,550

Claims priority, application Japan, Mar. 25, 1985, 60-42472[U]

Int. Cl.⁴ B65D *43/14, 51/04*

U.S. Cl. 220—334 4 Claims



1. A closure mechanism comprising a panel having an opening formed therein, a lid member journalled on said panel for opening and closing said opening and a biasing spring for biasing said lid member toward its closed position, the improvement comprising that said biasing spring is rigidly mounted at one end on said panel with the opposite free end of said biasing spring being resiliently engaged by said lid member under the action of a preselected biasing force to form a point of action, said point of action being slidably moved on the surface of said lid member depending on variations of the opening angle of said lid member, said point of action being thus located at the farthest position from the pivotal axis of said lid member, the distance between the point of action and the pivotal axis of said lid member being decreased as the opening angle of said lid member increases, whereby the biasing force exerted from said biasing spring to said lid member can be maintained substantially constant.

4,630,752

TRASH CAN HOOP RETAINER

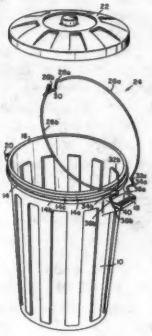
Robert A. DeMars, 7932 Maestro Ave., Canoga Park, Calif. 91304

Filed Apr. 21, 1986, Ser. No. 853,956

Int. Cl.⁴ B65D *67/12, 45/00*

U.S. Cl. 220—404 10 Claims

1. A trash can retainer for retaining trash bags in removable securement in a trash can having two lifting handles and a rim, comprising a rod-like body of substantially circular configuration, with means on one side for hingedly engaging in one of said handles of said trash can and means on the opposite side therefrom to engage said rim just above the second of said handles of said trash can in clamping relationship to thereby engage a top portion of said trash bag in friction-fit relationship.



4,630,753

DEVICE FOR DISPENSING DOSES OF LIQUID

Arnost Anscherlik, Schwarzenbergerstrasse 1, 8134 Adliswil, Switzerland

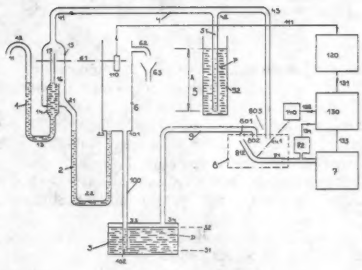
PCT No. PCT/CH84/00089, § 371 Date Jan. 25, 1985, § 102(e) Date Jan. 25, 1985, PCT Pub. No. WO84/04964, PCT Pub. Date Dec. 20, 1984

PCT Filed Jun. 4, 1984, Ser. No. 705,435

Claims priority, application Switzerland, Jun. 7, 1983, 3107/83; Jun. 16, 1983, 3295/83

Int. Cl.⁴ B67D *5/30*

U.S. Cl. 222—17 24 Claims



13. A pneumatic dosing device comprising

a dispensing tank for containing a liquid, said tank having (a) a vent tube extending from an upper portion of the tank where the vent tube includes an opening disposed above a predetermined level above the upper portion of the tank, (b) an inlet opening in said upper portion of the tank, and (c) a dispensing tube extending from a lower portion of the tank to at least a predetermined level; and

a filling bulb where at least said upper portion of said dispensing tank is disposed within and enclosed by the filling bulb;

a source of said liquid for said dispensing tank where said source is disposed below said tank;

an isolation pipe disposed between a lower portion of said filling bulb and said liquid source where said isolation pipe has an intermediate portion which is at a lower elevation

than the inlet and outlet thereof and where said isolation pipe is disposed above said liquid source;

a compressed air source;

means for filling said tank from said liquid source through said isolation pipe and said filling bulb until the liquid reaches said predetermined level in the dispensing tube and the filling bulb;

means for withdrawing the liquid from the filling bulb whereby liquid will remain in (a) the dispensing tank and its associated dispensing tube and (b) the isolation pipe; and means for supplying said compressed air to said dispensing tank to dispense the liquid remaining in said dispensing tank and the dispensing tube

whereby, during said filling of the dispensing tank, any air in the tank is forced through the dispensing tube and the vent tube to eliminate the formation of air bubbles.

4,630,754
FUEL SUPPLY SYSTEM

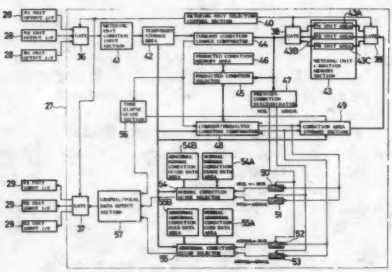
Shigemi Komukai, Yokohama, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Oct. 2, 1984, Ser. No. 657,016

Claims priority, application Japan, Oct. 15, 1983, 58-193027; May 19, 1984, 59-101278

Int. Cl.[4] B67D *5/32*; G05B *1/03*

U.S. Cl. 222—28 **3 Claims**



1. A fuel supply system, comprising in combination:

at least one metering unit having a pump and a flowmeter for supplying a metered amount of fuel through a fuel feed nozzle provided at the distal end of a fuel feed hose;

a detector for detecting the operating condition of said metering unit in various operational stages thereof;

a guide means actuatable to give information on the action to be taken in the next step of operation of said metering unit; and

a control system for controlling said guide means, arranged to send said guide means a signal of a predetermined form of guidance according to a signal from said detector to change the contents of said information to the next step of operation in each operational stage of said metering unit;

wherein said control system comprises:

a temporary storage means for temporarily storing a current metering unit condition signal supplied from said detector;

a metering unit condition memory means for storing the metering unit condition signal from said temporary storage means as a previous metering unit condition;

a condition predicting means for predicting a next metering unit condition according to the metering unit condition stored in said memory means;

a current condition comparison means for discriminating a change in current metering unit condition by comparing the metering unit conditions stored in said temporary storage means and said memory means;

a current/predicted condition comparison means for comparing the current metering unit condition from said temporary storage means with the predicted condition from said condition predicting means according to the results of comparison by said current condition comparison means; and

a guide means control means for controlling said guide means to give a guide for a next step of operation of said metering unit according to the results of comparison by said current/predicted condition comparison means.

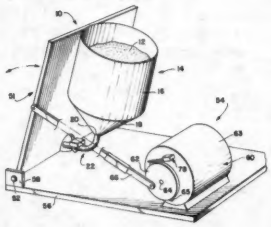
4,630,755
APPARATUS FOR PRECISELY DISPENSING FREE FLOWING SOLIDS

Jeptha E. Campbell, Cincinnati, Ohio, assignor to Spiral Systems, Inc., Cincinnati, Ohio

Filed Dec. 11, 1984, Ser. No. 680,496

Int. Cl.[4] B67D *5/14, 5/64*

U.S. Cl. 222—56 **21 Claims**



1. An apparatus for dispensing free flowing solids comprising:

(a) a container for holding a free flowing solid to be dispensed;

(b) a transporting means including a passage defined by a continuous closed surface for transporting particles of the free flowing solid through the passage, the transporting means having an inlet connected to the container and a discharge end located remote from the container, the passage having segments defining a transport angle having an apex greater than 90° but less than 180°, the transport angle causing the particles disposed within the passage to form a bridge within the passage which functions to stop the flow through the passage under the influence of gravity when the transporting means is inclined at a vertical angle of inclination less than a vertical angle of inclination at which gravity causes free flow of particles through the passage;

(c) means for selectively applying vibrations to the particles within the passage with an energy sufficient to cause the bridge to break apart to cause the particles to be free flowing from the container;

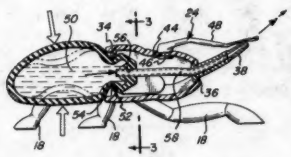
(d) means for varying the vertical angle of inclination of at least part of the transporting means with respect to a vertical reference to cause variation in the rate of flow of the particles through the passage as a function of the vertical angle of inclination during the application of vibrations to the particles; and

(e) the rate of flow of the particles through the passage being a linear function of the vertical inclination of the segment of the passage between the discharge end and the apex of the transport angle when the discharge end is inclined with a downward slope from the apex of the transport angle to the discharge end.

4,630,756
LIQUID SQUIRTING CREATURE

Francis R. Amici, Northford; Richard I. Farrington, New Britain, and Pietro Piazza, Prospect, all of Conn., assignors to Coleco Industries, Inc., West Hartford, Conn.

Filed Feb. 11, 1985, Ser. No. 700,395
Int. Cl.[4] A63H 3/24
U.S. Cl. 222—78 5 Claims



1. A liquid-squirting simulated creature comprising:

(a) a front member integrally formed of relatively rigid synthetic resin simulating a creature's head portion at its forward end portion and a creature's torso portion at its rearward end portion, said front member torso portion having a sidewall extending rearwardly from said head portion and a rear wall extending transversely inwardly from said sidewall adjacent the rearward end thereof to define a cavity therewithin, said rear wall having an aperture extending therethrough and said head portion having a nozzle aperture;

(b) a seperately formed rear member integrally formed of resiliently deflectable resin with a body portion simulating the rearward portion of the creature's body and a neck portion, said body portion and neck portion defining a chamber therewithin, said neck portion extending through said aperture of said rear wall of said front member and into said cavity therewithin, said neck cavity extending forwardly of said rear wall towards said head portion with its forward end spaced forwardly of said rear wall, said neck portion having a passage therethrough extending outwardly from said chamber providing the only aperture from said chamber, said rear wall of said front member engaging said neck portion of said rear member adjacent its rearward end;

(c) a tubular conduit having one end supported in said passage of said neck portion, said neck portion providing integrally formed sealing means at its forward end sealingly engaged with said conduit forwardly of said rear wall of said front member and extending therefrom to said nozzle aperture in said head, said conduit being imperforate along its length and open only at its ends at said nozzle aperture and said neck portion passage, whereby fluid may be drawn into an expelled from said chamber by compression of said rear member.

4,630,757
TOY GUN

Hiroshi Yano, 2 Jinai-Cho, 1-Chome, Moriguchi-Shi, Osaka, Japan (570)

Continuation of Ser. No. 371,492, Apr. 23, 1982, abandoned. This application Jul. 3, 1985, Ser. No. 750,998
Claims priority, application Japan, Apr. 25, 1981, 56-62829
Int. Cl.[4] A63H 3/18
U.S. Cl. 222—79 5 Claims

1. A toy gun for projecting a fluent material, comprising:

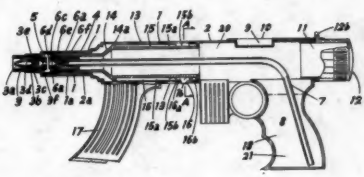
a front gun body and a hollow rear gun body, one having a cylinder means as a part thereof and the other having a piston means as a part thereof, said piston means being slidable in said cylinder means for a distance greater than the finger travel of a user;

spaced-apart handle means on the respective gun bodies projecting laterally thereof for gripping said bodies for relatively moving them for moving said piston means back and forth in said cylinder means;

a nozzle means on said piston or cylinder means on said front gun body;

a first one way valve means connected to said nozzle means for closing when said gun bodies are moved relative to each other for moving the piston means out of the cylinder means;

a second one way valve means on said piston or cylinder means on said rear gun body for closing when said gun bodies are moved relative to each other for moving said piston means into said cylinder means;



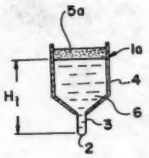
fluent material conduit means connected to said second one way valve means from within said rear gun body; and

a stop member on one of said gun bodies extending around the circumference of said one gun body, and a further stop member on the other of said gun bodies, said first mentioned stop member having a cut-out portion in the periphery thereof through which said further stop means can pass when the gun bodies are being assembled.

4,630,758
LIQUID TANK

Masayuki Mutoh, Machida, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 3, 1983, Ser. No. 463,544
Claims priority, application Japan, Feb. 20, 1982, 57-26477
Int. Cl.[4] B67D 3/00
U.S. Cl. 222—189 3 Claims



1. A liquid tank structure for reducing hydrostatic pressure at an outlet thereof, comprising a liquid container having an outlet at its lower portion, a capillary member within said liquid container for contacting a liquid therein to exert an upward force on the liquid for reducing the hydrostatic pressure at the outlet, said capillary member having a gradually decreasing apparent mean pore size in the upward direction.

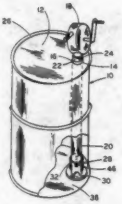
4,630,759
VESSEL WITH PUMP SUCTION TUBE SUPPORT

Ronald C. Dawn, 9517 Harrison Bay Rd., Harrison, Tenn. 37341

Filed Oct. 24, 1985, Ser. No. 791,055
Int. Cl.[4] B67D 5/40
U.S. Cl. 222—377 6 Claims

1. The combination of fluid storage vessel having a bottom wall, a top wall and an aperture in the top wall for receiving a pump suction tube having a circular cross section through which fluid may be pumped out of the vessel, and a suction tube support for supporting the lower end of the suction tube, said suction tube support comprising a base member fastened

to said bottom wall, tube support member secured to and extending upwardly from said base member, said support member comprising a hollow cylindrical body aligned with the aperture for receiving said tube, the bottom of said support member having wall means spaced above said base for permitting fluid to flow over the base member and into the interior of the support member for communication with the suction tube, the upper end of said support member including a slot extending diametrically therethrough, and said tube includes a pin receivable within said slot for precluding rotation of said tube when positioned in said support member.



4,630,760

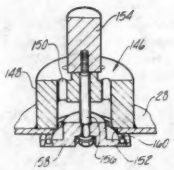
MAGNADRUM PUMP ASSEMBLY

Robert E. Wold, Troy, Mich., assignor to Johnstone Pump Company, Troy, Mich.

Division of Ser. No. 594,750, Mar. 29, 1984. This application Jul. 22, 1985, Ser. No. 757,377

Int. Cl.[4] B67D *5/42*

U.S. Cl. 222—387 **1 Claim**



1. A dispensing system for viscous materials comprising:

a ram plate for entry into the open end of a container for such material and having an opening therein;

an air driven pump motor having an air inlet circuit and an air exhaust circuit and having a positive displacement pick-up which operates through and in conjunction with the ram plate;

elevator means for raising and lowering the ram plate and the pump motor relative to the container;

a frame;

hanger means connecting the ram plate and air motor in depending relationship with the frame, said frame being supported by said elevator means above said container; and

valve means mounted on said ram plate for automatically admitting air to the space between the ram plate and the material in said container as said ram plate is drawn away from said material, said valve means comprising:

(A) a cup shaped valve body mounted on said ram plate over said ram plate opening and having a top wall and an annular side wall coacting to define a central downwardly opening cavity communicating with and substantially coextensive with said opening;

(B) a central plunger passing through said top wall of said body and downwardly through said cavity and through said opening;

(C) a plate member secured to the lower end of said plunger below said opening;

(D) an annular valve seat defined on the upper surface of said plate member and sealingly coacting with the confronting undersurface of said ram plate around said ram plate opening;

(E) a weight secured to the upper end of said plunger above said top wall and normally resting on said top wall when said annular valve seat is spaced downwardly from said confronting undersurface of said ram plate thereby to open said valve means by gravity action; and

(F) vent means in said body communicating between said cavity and atmosphere to allow the escape of air from the container, past said valve seat, and through said vent means.

4,630,761

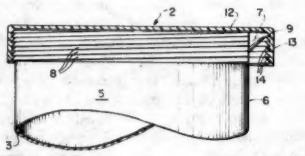
CONTAINER WITH POURING SPOUT AND REMOVABLE COVER

Loronzo H. Thomson, Warner Robins, Ga., assignor to Little Rapids Corp., Green Bay, Wis.

Filed Mar. 12, 1984, Ser. No. 588,814

Int. Cl.[4] B65D *47/00, 5/72, 41/04;* A61B *5/00*

U.S. Cl. 222—551 **5 Claims**



1. In a container, the combination of

an integral hollow container body having a side wall and a bottom wall,

the side wall having an upper end portion and a bottom end portion and being of such configuration that any transverse cross section of the side wall defines a closed figure,

the bottom end portion of the side wall joining the bottom wall and being closed thereby,

the upper end portion of the side wall comprising external rib means including portions which lie generally on a circle which is generally transverse to the container body,

a portion of the side wall extending generally as a chord with respect to said circle,

the upper end portion of the side wall terminating in an upper edge lying in a plane transverse to the container body,

said portion of the side wall having an upper edge which forms part of said upper edge of the side wall and is interrupted by an outwardly projecting pouring spout having an upper edge which is coplanar with said upper edge of the side wall,

the pouring spout being of generally triangular transverse cross section and terminating in a tip lying on said circle, said tip being formed to constitute a portion of said rib means; and

a detachable cover including a main wall and dependent securing means joined to the main wall,

the main wall of the cover being of such size and shape as to be capable of simultaneously engaging the upper edge of the side wall and the upper edge of the pouring spout,

the dependent securing means including inwardly directed retaining rib means constructed and arranged to mate with the external retaining rib means of the container body and the tip of the pouring spout,

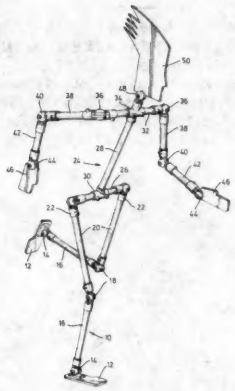
the external retaining rib means, the tip of the pouring spout, and the inwardly directed retaining rib means being so located that, when the rib means are fully mated, the main wall of the cover engages both the upper edge of the side wall of the container body and the upper edge of the pouring spout and thus closes the entire container including the pouring spout.

4,630,762

MANNEQUIN

Richard G. Stringer, London, England, assignor to R. G. Stringer and Andre Clive Michell, both of London, England

Filed Aug. 15, 1985, Ser. No. 766,128
Int. Cl.[4] A41H *5/00*
U.S. Cl. 223—66 **6 Claims**



1. A mannequin comprising, in combination:
(a) a pair of feet forming members;
(b) a first pair of elongated rads forming calves of said mannequin, each having upper and lower ends;
(c) first lockable swivel joints connecting the lower ends of each of said rods of the first pair, each to a separate one of said feet forming members;
(d) a second pair of elongated rods forming thighs of said mannequin, each having upper and lower ends;
(e) second lockable swivel joints connecting the lower ends of each of said rods of the second pair to the upper end of a separate one of the rods of the first pair;
(f) a frame including a first transverse rod forming a pelvis of said mannequin and a second transverse rod forming shoulders of said mannequin, said first and second rods each having ends;
(g) third lockable swivel joints each connecting one of the ends of said first transverse rods to a separate one of the upper ends of said second elongate rods;
(h) a third pair of rods, forming upper arms of said mannequin and having upper and lower ends;
(i) fourth lockable swivel joints each connecting one of the ends of said second transverse rod to a separate one of the upper ends of said third pair of rods;
(j) a fourth pair of rods, forming forearms of said mannequin and having upper and lower ends;
(k) a fifth pair of lockable swivel joints connecting the upper ends of said fourth pair of rods to the lower ends of said third pair of rods;
(l) a pair of hand forming members each mounted at the lower end of a separate one of said fourth pair of rods;
(m) a head forming member secured to the frame;
(n) means on each of said swivel joints permitting said swivel joints to be locked in any one of a number of different positions, and
(o) said lockable swivel joints each comprising first and second pivotal elements, a threaded pivot pin passing through said first and second elements and allowing said elements to pivot relative to one another about a first axis, a third element formed separately from the first and second elements and positioned on the side of the second element remote from said first element, complementary thread means on said third element effective to receive said threaded pin, means to prevent significant rotation of said third element relative to said first element, whereby tightening of said pin locks said first and second elements against rotation about said first axis, means allowing an elongated rod to be attached to each end of said first and second elements, while allowing relative rotation between the elongate rod and the associated one of said first and second elements about the axis of the elongate rod and means to secure the end of each elongated rod to the associated first or second element.

4,630,763

APPARATUS FOR SUPPORTING THE WEIGHT OF A BANJO IN ADJUSTABLE PROPORTIONS FROM BOTH THE TORSO AND THE SHOULDERS OF A PLAYER

Daniel J. Friedman, 8960 Cynthia St. #201, West Hollywood, Calif. 90069

Filed May 28, 1985, Ser. No. 738,449
Int. Cl.[4] A45F *3/04*
U.S. Cl. 224—259 **3 Claims**

1. Apparatus for supporting and distributing the weight of a banjo, in playing position, from both the waist or hips and the shoulders of a banjo player in adjustable proportion, comprising:
first substantially nonresilient dual strap means for supporting a first significant fraction of such banjo weight from such palyer's waist or hips while the banjo is in use, said first strap means being connected to two separated points at respective sides of the banjo body and passing substantially around such player's waist or hips and behind such player's back;
second substantially nonresilient strap means for supporting a second significant fraction of such banjo weight from such player's two shoulders approximately equally while the banjo is in use, said second strap means being connected near the top of the banjo body remote from both of said two separated points and passing over such player's shoulders and behind such player's back; and
weight-distribution means for controlling the relative size of said first and second fractions of such banjo weight while the banjo is in use; and wherein:
said second strap means are connected to the top of the banjo body through the weight-distribution means, and comprise:
separate left and right shoulder straps secured together at a junction in front of such player's torso, and
a connector depending from said junction of the left and right shoulder straps;
said weight-distribution means comprise an adjustable linkage, depending from the connector and connected to the

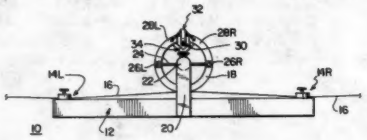
top of the banjo body at substantially only a single point, for controlling tension in the shoulder straps; and adjustment of the linkage varies the relative size of said first and second fractions controllably.

4,630,764

FIBER OPTIC CABLE CLEAVING TOOL

Fred D. West, 6800 Curry Dr. Box 32514, The Colony, Tex. 75056

Filed Oct. 18, 1985, Ser. No. 789,193
Int. Cl.[4] C03C *37/16*
U.S. Cl. 225—2 **6 Claims**



1. The method of cleaving optical fibers to achieve substantially flat-end surfaces at a desired point of cleavage comprising the steps of:

(a) reeving the optical fiber to be cleaved around a drum having a peripheral cleaving break therein with the optical fiber spanning said cleaving break;

(b) circumferentially scoring said optical fiber at the desired point of cleavage within said cleaving break; and

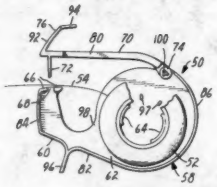
(c) expanding the size of said cleaving break by changing the curvature of said drum to thereby tension said optical fiber and effect a cleavage therethrough at the circumferentially scored point of cleavage.

4,630,765

DISPENSER FOR TAPE WITH A STRETCHABLE BACKING

Bruce E. Samuelson, West Lakeland Township, Washington County, and John T. Rueb, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 22, 1985, Ser. No. 736,254
Int. Cl.[4] B65D *85/672*
U.S. Cl. 225—96 **3 Claims**



1. A tape dispenser of the type including a roll of pressure sensitive adhesive coated tape having a stretchable backing; and

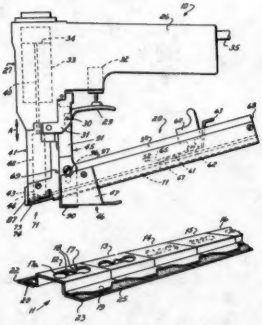
a housing comprising walls including opposed top and bottom walls, and opposed front and rear walls each intersecting different corresponding ends of said top and bottom walls, said housing including a base portion formed by walls including said front wall, said bottom wall, and said rear wall that define a cavity, walls defining a hub transverse of said cavity about which hub said roll of tape is rotatably mounted, and walls defining a land area spaced from said hub at the end of said front wall adjacent said top wall against which land area tape from said roll may be releasably adhered, the walls defining said land area defining a slot transverse of said land area and providing a portion of said land area on both sides of said slot; said housing also including a cover portion formed by walls including said top wall and having a row of teeth located at the end of said top wall adjacent said front wall adapted to move into said slot to cut through tape adhered on said land area, and means between said rear wall and said top wall for mounting said cover portion on said base portion for relative pivotal motion between an open position with the teeth spaced from the slot and a closed postion with the teeth disposed within the slot; said cover further including a generally L-shaped wall having one part projecting away from said top wall and front wall and a second part projecting along and in spaced relation to said top wall so that said top wall and generally L-shaped wall define a socket therebetween adapted to receive a portion of a user's thumb so that the user may grasp the dispenser in one hand with his fingers around the base portion and his thumb in the socket and with one hand alone move said cover and base portions between said open and closed positions.

4,630,766

FASTENER DRIVING APPARATUS AND METHODS AND FASTENER SUPPLY

Jay M. Steeves, and Gilbert A. Cotta, both of Cincinnati, Ohio, assignors to Senco Products, Inc., Cincinnati, Ohio

Filed Jun. 1, 1983, Ser. No. 499,862
Int. Cl.[4] B21J *15/28*
U.S. Cl. 227—8 **18 Claims**



1. Fastener driving apparatus for driving a fastener onto a fastener receiving member, and including:

a reciprocating fastener driver means movable in a drive path;

a fastener magazine means for feeding fasteners serially to a drive position beneath said driver means from where they can be driven onto a fastener receiving member;

said magazine means inclined at an acute angle with respect to the direction of movement of said driver means;

a guide foot extending beneath said magazine laterally of said drive position and having a reference surface in a plane perpendicular to the direction of reciprocation of said driver means, said guide foot including slot means in said reference surface spaced outside said drive path for receiving a fastener receiving member and for guiding said apparatus with respect to said member; and

means for moving said driver means to drive a fastener onto a fastener receiving member.

4,630,767

METHOD OF BRAZING USING A DUCTILE LOW TEMPERATURE BRAZING ALLOY

Howard Mizuhara, San Mateo, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 757,962, Sep. 20, 1984, which is a continuation of Ser. No. 394,226, Jul. 1, 1982, abandoned. This application Aug. 15, 1985, Ser. No. 765,832
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—122 **2 Claims**

1. The method of joining silicon nitride to another part by

brazing comprising the steps of:

preparing a brazing alloy composition consisting essentially of 20 to 98.75 weight percent silver, 20 to 40 weight percent copper, and 0.25 to 4 weight percent titanium, said composition having a liquidus temperature in the range from about 750° to 950° C.; rolling the brazing alloy composition down to a thin foil; disposing brazing alloy in said thin foil form between an assembly comprising the silicon nitride and the part to which the silicon nitride is to be brazed; and heating said assembly in vacuum to a temperature at which the foil melts, thereby brazing the silicon nitride to said part.

4,630,768

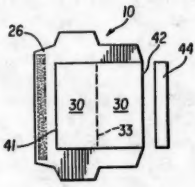
ENVELOPE AND ENCLOSURE SHEET

William P. Bradley, Hollidaysburg, Pa., assignor to Bedford Engineering Co., Armonk, N.Y.

Division of Ser. No. 574,308, Jan. 26, 1984, Pat. No. 4,531,993. This application Jun. 12, 1985, Ser. No. 733,783

Int. Cl.⁴ B65D *27/00*

U.S. Cl. 229—92.7 **1 Claim**



1. A mailing sub-assembly comprising:

an envelope sheet and an enclosure sheet, said enclosure sheet positioned upon said envelope sheet to form a part double layer and part triple layer of a sheet material wherein one edge of said envelope sheet is in colinear alignment with one edge of said enclosure sheet;

said envelope sheet having four score lines forming a rectangle wherein two of said four separate score lines and said edge that is in colinear alignment with one edge of said enclosure sheet are parallel; and

said enclosure sheet being free of adhesive material and having one score line wherein said one score line is parallel to said edge that is in colinear alignment with one of said two parallel envelope sheet score lines; and

wherein one edge of said enclosure sheet and said score line on said enclosure sheet lie within said rectangle formed by said score lines of said envelope sheet.

4,630,769

DOCUMENT STORAGE CONTAINER

Randell D. Ball, 1141 Elk, Yukon, Okla. 73099

Filed May 8, 1985, Ser. No. 732,255

Int. Cl.⁴ B65D *91/00*

U.S. Cl. 232—1 D **11 Claims**

1. A document storage container, comprising:

a receptacle having an open-ended cavity defined therein;

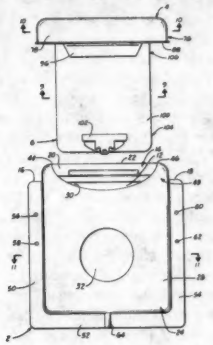
lid means for removably closing the open end of said cavity;

document retaining means, connected to said lid means and received within said cavity when said lid means closes the open end of said cavity, for retaining a document so that the document moves into and out of said cavity when said lid means moves onto said receptacle to close the open end of said cavity and off of said receptacle to open the open end of said cavity, wherein said document retaining means includes a clipboard; and

wherein said lid means includes:

a cap having an interior hollow region opening through a mouth, said hollow region receiving a portion of said receptacle through said mouth when said lid means closes the open end of said cavity; and

a web connected to said cap so that said web extends into said interior hollow region, said web having said clipboard connected thereto.



4,630,770

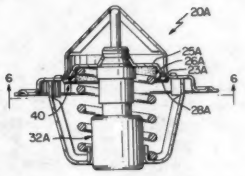
VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Boyd P. Sliger, Concord, and Joseph P. Wagner, Knoxville, both of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 25, 1985, Ser. No. 791,378

Int. Cl.⁴ F16K *51/00, 1/00*

U.S. Cl. 236—34.5 **18 Claims**



1. In a valve construction having an annular valve seat means and a movable valve member for opening and closing said valve seat means and being operatively interconnected to a thermal power element that is carried by said valve construction, said valve member having an annular rigid part for engaging said valve seat means and having an annular flexible part for also engaging said valve seat means at a point upstream of said rigid part, said parts of said valve member being so constructed and arranged that said rigid part moves out of engagement with and away from valve seat means a certain distance before said flexible part moves out of engagement with said valve seat means, the improvement wherein said flexible part of said valve member has opening means therethrough that is adapted to provide a certain sized fluid flow path through said flexible part of said valve member when said rigid part of said valve member is in a position to be just out of engagement with said valve seat means and said flexible part of said valve member is still in engagement with said valve seat means, said opening means providing a fluid flow path through said flexible part of said valve member that increases in size from said certain size thereof as said rigid part of said valve member moves from said position to be just out of engagement with said valve seat through said certain distance thereof.

4,630,771

ECONOMICAL FOUNTAINHEAD

Bill R. Hall, 2206 Annandale Rd., Huntsville, Ala. 35801

Filed Nov. 20, 1985, Ser. No. 799,786

Int. Cl.⁴ B05B *17/08*

U.S. Cl. 237—17 **2 Claims**

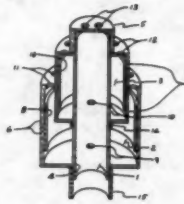
1. An ornamental fountainhead to produce three tiers of

water spray which is constructed of slightly modified, standard Polyvinyl Chloride, PVC, plumbing parts to form different pressure chambers and flow paths to feed each tier, the construction consists of:

a low pressure chamber constructed of an upper and a lower large-sized standard PVC cap connected to each other by a cemented matching sized standard PVC pipe, the upper cap having an upper wall with a hole and having

output orifices located circumferentially around the outer portion of the upper wall of said upper cap, the lower cap having a central hole;

an intermediate pressure chamber constructed of an upper and a lower intermediate-sized standard PVC pipe cap connected to each other by a cemented matching intermediate-sized standard PVC pipe, the intermediate-sized pipe tightly and axially penetrating the hole in the upper cap of the low pressure chamber, said upper and lower intermediate-sized caps abutting the upper and lower surfaces of the upper wall of the low pressure chamber,



respectively, and being cemented thereto, forming a secure seal, the upper and lower caps of the intermediate pressure chamber having centrally located holes, the upper intermediate-sized cap having outlet orifices located circumferentially on the outer edge of the top surface;

a high pressure chamber being constructed from a small standard sized PVC pipe and capped at the upper end with a matching sized standard PVC cap, and having one or more outlet orifices on its upper surface, wherein the high pressure chamber passes tightly and axially through the hole in the lower cap of the low pressure chamber forming inlet pressure means for the fountainhead and passes tightly and axially through the holes in the upper and lower caps of the intermediate pressure chamber, the high pressure chamber pipe having an approximate number and sizes of orifices located in a manner to connect the low and intermediate pressure chambers to the high pressure chamber thereby creating a controlled source of water for the low and intermediate pressure chambers.

4,630,772

INSULATING PLATE FOR RAIL INSULATED JOINT

Kainen Watanabe, Tokyo; Hiroto Yasuhara, Ayase; Toru Sugiyama, Kunitachi; Keiji Shimizu, Tokyo, and Yoshihiro Murata, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka and Japanese National Railways, Tokyo, both of, Japan

Continuation of Ser. No. 641,287, Aug. 16, 1984, abandoned. This application Apr. 4, 1986, Ser. No. 848,908

Claims priority, application Japan, Aug. 18, 1983, 58-149663

Int. Cl.[4] F01B *11/00*

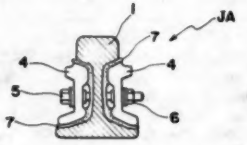
U.S. Cl. 238—159 **6 Claims**

1. In an insulating plate for forming an insulated rail joint by positioning said insulated plate between a rail and a joint plate clamped thereto, said insulating plate being of the type having upper and lower flanges connected by a web, whereby said insulating plate is clamped between the rail and the joint plate with the joint plate contacting said upper and lower flanges, the improvement of means for increasing the area of contact of said insulating plate with the joint plate and comprising:

upper and lower portions of said insulating plate being thickened, said thickened portions comprising said upper and lower flanges and respective portions of said web contiguous to said upper and lower flanges;

said insulating plate being formed of a thermoplastic resin material; and

means, provided in said thickened portions only of said



insulating plate, for heating said thickened portions to soften said thermoplastic resin material to an extent such that clamping of the joint plate enables the softened thermoplastic resin material of said thickened portions to deform to the configuration of the joint plate, whereby the joint plate contacts said insulating plate throughout the area of said thickened portions including said upper and lower flanges and said respective contiguous web portions.

4,630,773

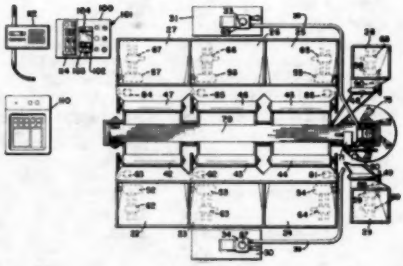
METHOD AND APPARATUS FOR SPREADING FERTILIZER

Earl W. Ortlip, Carefree, Ariz., assignor to Soil Teq., Inc., Waconia, Minn.

Continuation of Ser. No. 668,736, Nov. 6, 1984, abandoned. This application Feb. 5, 1986, Ser. No. 827,225

Int. Cl.[4] B05B *17/00, 17/04, 9/06*

U.S. Cl. 239—1 **18 Claims**



1. Fertilizer blending and spreading apparatus comprising:

a vehicle;

a plurality of product bins mounted on said vehicle, each of said bins for holding a product to be applied to a field to be fertilized;

a plurality of feeder means mounted on said vehicle, each one of said feeder means operative in response to a feeder control signal for dispensing product at a selected dispensing rate from one of said bins;

conveying and spreading means mounted on said vehicle for conveying product dispensed from said bins via said feeder means and spreading said product over the ground; and

control means operatively connected to said plurality of feeder means for generating said feeder control signals to control the rate of dispensation of each of said products,

said control means including:

(a) digital soil map means for storing a digital soil map indicating the distribution of different soil types in said field to be fertilized;

(b) x-y locator means for indicating the position of said vehicle relative to said field as it moves about said field;

(c) speed indicator means for indicating the speed of said vehicle as it moves about said field; and

(d) means responsive to said soil map means, said locator means and said speed indicator means for controlling the generation of said feeder control signals by correlating the location of the vehicle in the field to said map and determining the type of soil the vehicle is currently over and adjusting said feeder control signals in response to the determined soil type and the vehicle speed to provide that each of said products can be applied at different rates to different soil types in the field as the vehicle moves about the field.

4,630,774

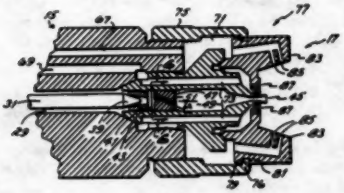
FOAM GENERATING NOZZLE

William R. Rehman, Vermillion, and James C. Smith, Lorain, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 436,012, Oct. 22, 1982, Pat. No. 4,533,701. This application Aug. 22, 1985, Ser. No. 768,555

Int. Cl.[4] B05B *17/00*

U.S. Cl. 239—8 **3 Claims**



1. The method of forming a liquid/gas solution into a foam, the gas being maintained in solution in the liquid, comprising:

conveying the liquid/gas solution into a foaming chamber formed in a nozzle assembly;

impacting the liquid/gas solution against an obstruction within the foaming chamber to agitate the liquid/gas solution;

maintaining while the liquid/gas solution is conveyed into the foaming chamber a pressure in the foaming chamber which is greater than atmospheric but less than the pressure required to maintain all of the gas in solution in the liquid, at least a portion of the gas evolving from solution within the foaming chamber and becoming entrapped in the surrounding liquid to form a foam.

4,630,775

DISPENSER FOR RELEASING A VOLATILE ACTIVE SUBSTANCE

Jean-Pierre Mandon, Chasseneuil du Poitou, and Jean Rapiteau, Saint Benoit, both of France, assignors to Airwick Industries, Inc., Carlstadt, N.J.

Filed May 6, 1985, Ser. No. 730,527

Claims priority, application Switzerland, May 11, 1984, 2334/84

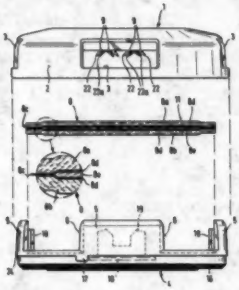
Int. Cl.[4] A61L *9/04*

U.S. Cl. 239—56 **6 Claims**

1. A dispenser for releasing a volatile active substance from a carrier material which surrounds a liquid-impermeable sheath containing the active substance in liquid form, said dispenser comprising:

a base circular part having supporting members for said carrier material and having a sidewall section with a plurality of apertures;

an upper circular part rotatably mounted on the base circular part and having a cylindrical sidewall section with a plurality of apertures equal in number and size to the apertures on the sidewall section of said base circular part, the upper circular part adapted to be rotated relative to the base circular part so as to cause the respective apertures to be in an open position in register with each other, in a partially open position in partial register with each other, or in a closed position out of register with each other; and



at least one decentrally positioned flexible blade disposed on the inner surface of said upper circular part and adapted, upon rotation of the upper circular part from the closed position to a partially open position, to pierce the sheath containing said active substance, thereby causing the carrier material to be impregnated with the active substance.

4,630,776

LIQUID DISPERSAL DEVICE

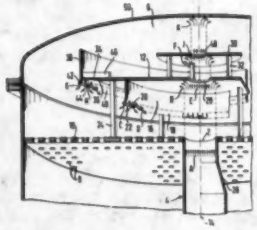
Josef Findling, Ettlingen, Fed. Rep. of Germany, assignor to GEA Wiegand GmbH, Fed. Rep. of Germany

Filed Jul. 22, 1985, Ser. No. 757,311

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1984, 3427298

Int. Cl.[4] B05B *1/26*

U.S. Cl. 239—553.3 **8 Claims**



1. A manifold device for the dispersal of a liquid from an end of a supply line, comprising:

a dispersal chamber defined by a top wall and a bottom wall, the supply line penetrating the bottom wall from below, and the bottom wall being provided with a plurality of openings;

a deflector plate located in the dispersal chamber spaced

above the end of the supply line for deflecting the liquid impinging thereupon from below from the end of the supply line toward an edge of the deflector plate;

a collar attached to the underside of the deflector plate and encompassing the axis of the supply line; and

tab means along a lower edge of the collar and radially bent alternately inwardly and outwardly from the edge of the collar.

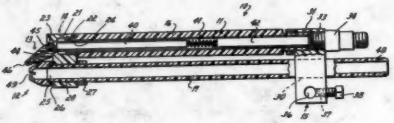
4,630,777
POWDER SPRAY GUN

Thomas E. Hollstein; James J. Turner, both of Amherst; Douglas C. Mulder, Wellington, and David E. O'Ryan, Avon Lake, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Continuation of Ser. No. 583,898, Feb. 27, 1984, abandoned. This application Dec. 20, 1985, Ser. No. 814,273

Int. Cl.[4] B05B *5/04*

U.S. Cl. 239—707 **1 Claim**



1. An electrostatic spray gun for spraying solid particulate powder materials comprising:

an electrically non-conductive housing, said housing comprising a pair of spaced mounting blocks and a pair of parallel tubes extending between said mounting blocks, one of said mounting blocks being spaced forwardly of the other, the forwardmost mounting block having an electrode extending forwardly therefrom,

a first one of said pair of parallel tubes being fixedly mounted to said forwardmost mounting block,

an electrical resistor mounted within said first one of said pair of tubes, said electrical resistor being electrically connected to said electrode,

the second one of said pair of tubes being of adjustably mounted in said forwardmost mounting block,

said second one of said pair of tubes being a straight powder transport tube, said powder transport tube having an inlet end and a forward outlet end, nozzle means mounted to the forward outer end of the powder transport tube,

locking means for removably securing said powder transport tube and said nozzle means in an adjustable position relative to said forwardmost mounting block and said forwardly extending electrode,

said first one of said pair of parallel tubes being fixedly mounted in the rearwardmost of said mounting blocks,

said powder transport tube being slideably received in a bore of said second mounting block so as to facilitate removal and replacement of said powder transport tube from said mounting blocks, and

means for supporting said electrostatic spray gun from said second mounting block.

4,630,778
SEPARATION OF MIXTURES OF BITUMINOUS COAL AND LOWER RANK COAL BY SELECTIVE CHEMICAL COMMINUTION

Ju-Nam Chew, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

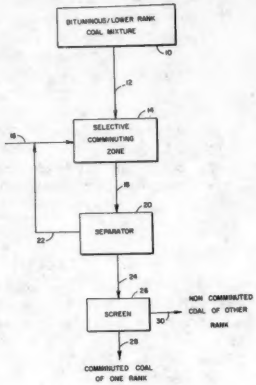
Filed Nov. 14, 1983, Ser. No. 550,709

Int. Cl.[4] B02C *19/00*

U.S. Cl. 241—1 **11 Claims**

1. A method for separating a mixture of bituminous coal and a lower rank coal comprising the steps of:

(a) contacting said coal mixture with an effective amount of a dilute aqueous methanol solution, of a strength of about 75 volume percent and sufficient to give substantially better comminution reactivity than substantially anhydrous methanol, and maintaining said contact for a time sufficient whereby said methanol selectively comminutes a substantial portion of bituminous coal to a reduced particle size;



(b) separating the comminuted bituminous coal of one rank and noncomminuted coal of the other rank from said methanol comminuting solution; and

(c) separating the comminuted coal particles of one rank from the noncomminuted coal of the other rank.

4,630,779
METHOD FOR DISCHARGING CONSOLIDATED WASTE CATALYST

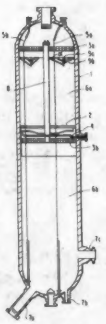
Osamu Suuchi, Tokyo; Shuzo Mimaya, and Masaru Ohashi, both of Okayama, all of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1985, Ser. No. 761,719

Claims priority, application Japan, Aug. 2, 1984, 59-161527; Dec. 28, 1984, 59-274409

Int. Cl.[4] B02C *19/12*

U.S. Cl. 241—1 **8 Claims**



1. A method for discharging a consolidated waste catalyst from a reactor, comprising the steps of:

(1) making at least one hole in the catalyst;

(2) filing said hole with a hydrative expansive fracturing agent in the presence of water;

(3) heating the part of the agent which is at the open end of the at least one hole so that said part of the agent will

expand and solidify earlier than the other portions of the fracturing agent;

(4) leaving said catalyst to stand until it is fractured by said agent; and

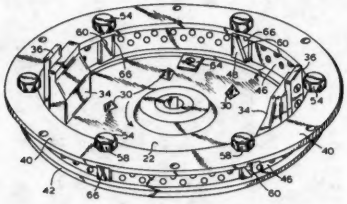
(5) discharging the fractured catalyst from the reactor.

4,630,780

REPLACEABLE BEVELED SHEAR MEMBERS FOR A WASTE PULPING MACHINE

Robert W. Immel, Newtown Square, and Evan P. Fields, Pomeroy, both of Pa., assignors to Somat Corporation, Pomeroy, Pa.

Filed Dec. 24, 1984, Ser. No. 686,014
Int. Cl.⁴ B02C *18/42*
U.S. Cl. 241—46 B **10 Claims**



1. A pulping apparatus for comminuting waste material comprising:

a rotary disc impeller;

a sieve ring encircling said impeller, said sieve ring having a bottom edge and a top edge and being formed with a plurality of through apertures;

at least one first shear means support means secured to said impeller;

at least one second shear means support means secured stationary with respect to said rotary impeller;

first shear means removably mounted to said first shear member support means;

second shear means mounted to said second shear means support means, said second shear means extending between said top and bottom edge of the sieve ring and interposed between sections of the sieve ring, said second shear means having at least two cutting edges spaced apart a predetermined amount, said second shear means being rotationally adjustably mounted to said second shear means support means so that upon rotational adjustment, a different cutting edge comes into play; said first shear member having a cutting edge for periodically coming into play with a cutting edge of said second shear means portions upon rotation of said impeller; said cutting edge of said second shear means having a beveled cutting edge inclining in the direction of rotation of the rotary disk impeller so that unpulpable material is pushed above the shear member and away from the impeller.

4,630,781

APPARATUS AND METHOD FOR REMOVING CRUSHING ROLLS FROM A CRUSHING APPARATUS

Donald W. Brown, Jr., St. Louis, Mo., and Mark L. Kohler, Waterloo, Ill., assignors to T.J. Gundlach Machine Company, Belleville, Ill.

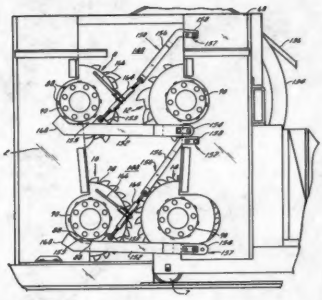
Filed Jul. 11, 1984, Ser. No. 629,656
Int. Cl.⁴ B02C *4/28*
U.S. Cl. 241—159 **13 Claims**

1. In a roll crushing apparatus having first and second rotatable crushing rolls disposed with their axial lengths parallel, the combination comprising:

first means for supporting and holding the first crushing roll to permit rotation of said roll, the first crushing roll being releasable from the first means;

second means movable in a direction away from the first means for supporting the second crushing roll at a crushing position adjacent the first roll and the first means, and moving the second crushing roll from said crushing position to a position spaced from the first means for greater accessibility to said rolls;

roll removal means removably mounted on the second means for supporting the first crushing roll upon release of the latter from the first means and carrying the first crushing roll to a position spaced from the first means as the roll removal means moves with the second means;



said roll removal means comprising a pair of arm means, one of the arm means being engageable with the first crusher roll and the other of the arm means being engageable with the first roll at a position spaced from the one arm means along the axial length of the first roll;

said arm means comprising a first arm connected to the second means and extendable into engagement with the first crushing roll and a second arm connected to the first arm and the second means; and

said arm means being constructed and arranged to be mounted to said second means primarily during the roll removal process.

4,630,782

METHOD AND APPARATUS FOR FORMING A THREAD RESERVE FROM THE THREAD END OF A TEXTILE COIL

Joachim Rohner, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

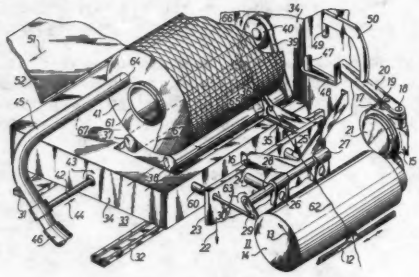
Continuation of Ser. No. 683,967, Dec. 20, 1984, abandoned, which is a continuation of Ser. No. 556,066, Nov. 29, 1983, abandoned, which is a continuation of Ser. No. 426,692, Sep. 29, 1982, abandoned, which is a continuation of Ser. No. 789,622, Apr. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 658,883, Feb. 18, 1976, abandoned. This application Sep. 16, 1985, Ser. No. 775,715

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1975, 2506930

Int. Cl.⁴ B65H *54/02*
U.S. Cl. 242—18 EW **8 Claims**

1. A method for forming a thread reserve from a thread end of a textile coil fully wound on a coil core having an end projecting out of the textile coil and frictionally driven by a winding roller in a winding device, which comprises removing the textile coil from the winding device by means of a coil removing device, retaining the coil on the coil removing device, pneumatically seizing a thread extending between the winding roller and the textile coil by means of a suction gripper and sucking the thread in the form of a loop into a mouth of a suction gripper while simultaneously rotating the textile coil in

a direction opposite to the direction in which a thread has been previously wound on the coil, severing the thread between the suction gripper and the winding roller by thread clamping shears while firmly holding a thus severed thread end from the winding roller and setting free a thus severed thread end of the



textile coil, swinging the mouth of the suction gripper to the end of the coil core projecting out of the textile coil, releasing the thread end at the coil core, and disposing a length of the thread end of the textile coil as a thread reserve on the coil core.

4,630,783

MACHINE FOR WINDING A WEB OF PAPER ON A ROLL

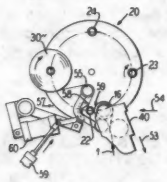
Werner Mülfarth, Kirchheim, Fed. Rep. of Germany, assignor to Beloit Corporation, Beloit, Wis.

Filed Jun. 21, 1985, Ser. No. 747,297

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1984, 3423987

Int. Cl.[4] B65H *19/26, 19/28*

U.S. Cl. 242—56 A **9 Claims**



1. A machine for winding webs of paper and the like onto a roll core, said machine comprising a frame; a plurality of work stations mounted in the frame; a turret mounted for rotation on an axis in said frame, said turret having a plurality of winding shafts, which receive tubular cores on which the web is wound, being mounted for rotation in the turret with the shafts being spaced around a circle concentric with the axis; means for rotating the turret in a step-like manner to move the shafts from station-to-station; and one of the work stations being a winding station having blade means for cutting a web and means for aiding the winding of the web onto a core at that station, said blade means including a cutting edge extending parallel to the shaft and means for moving the edge in a direction perpendicular to the edge from a retracted position to a cutting position, said means for aiding including a contact roller extending parallel to the shaft and positioning means for moving the roller approximately along the circle to press a web against the core on which it is being wound, said positioning means also moving the contact roller radially to the circle and the turret to clear the circular path of the next shaft being moved into the winding station so that as the winding of a roll on the shaft at the winding station nears completion, the contact roller is moved radially out of the path of a newly presented shaft and core and coacts with the blade means to cut the web and entrain the leading cut end of the web onto the newly presented core to begin winding.

4,630,784

PROCESS AND DEVICE FOR MANUFACTURING MOTHER CAPACITORS BY HELICAL WINDING

Claude Roy, Bagnolet, France, assignor to L.C.C.-C.I.C.E.-Compagnie Europeenne des Composants Electroniques-36, Bagnolet, France

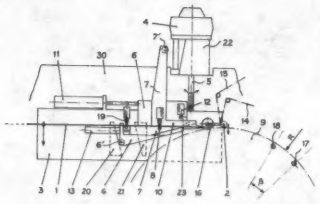
Continuation of Ser. No. 457,476, Jan. 12, 1983, Pat. No. 4,494,704. This application Dec. 5, 1984, Ser. No. 678,279

Claims priority, application France, Jan. 12, 1982, 82 00374

The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.

Int. Cl.[4] B65H *35/04, 39/16;* H01G *13/02*

U.S. Cl. 242—56.1 **22 Claims**



1. A process for manufacturing mother capacitors separated by an insert to form a block wherein the insert divides the block into at least two superposed mother capacitors, comprising spiral winding of metalized films on a wheel as well as periodic interpositioning, after a given number of winding revolutions, of said insert having an input or leading edge and a rear edge, which process comprises an operation for making the position of an insert interpositioning device dependent on the position of the external layer of the winding, and an insert interpositioning operation comprising the steps of stopping said wheel, moving the interpositioning device from a rear, so-called rest, position to a forward position for presenting the insert by its leading edge, setting the wheel again in rotation so as to interposition said insert, moving the interpositioning device from its forward position to its rear position so as to continue winding of the films, and cutting said insert.

4,630,785

COILER

Rudolf Buchegger, St. Florian, and Rudolf Langeder, Mauthausen, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jun. 10, 1985, Ser. No. 742,743

Claims priority, application Austria, Jun. 18, 1984, 1972/84

Int. Cl.[4] B65H *75/24*

U.S. Cl. 242—72.1 **8 Claims**

1. In a coiler comprising an expanding coiler core comprising

a tubular coiler shaft,

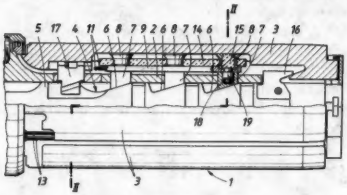
a plurality of extensible segments, which are adapted to be heated and constitute an annular series surrounding said shaft and are mounted in said coiler core to be radially extensible and retractable,

an expanding mechanism, which extends in said shaft and is movable along said shaft to radially extend and retract said extensible segments, and

heat insulating material and cooling means extending between said extensible segments and said shaft and arranged to restrict the transfer of heat from said extensible segments to said shaft,

the improvement residing in that

a plurality of pressure applying tubes extend between each of said segments and said expanding mechanism, each of said tubes having an axis which is radial with respect to



said coiler shaft and having a wall thickness which increases toward the associated extensible segment, and

said cooling means extend between all of said pressure applying tubes and said expanding mechanism.

4,630,786

APPARATUS FOR DISPENSING PLASTICS STRETCH FILM

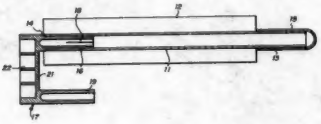
James Lambert, Kehlen, Luxembourg, and William E. Rice, Fairport, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 636,771, Aug. 1, 1984, abandoned. This application May 1, 1986, Ser. No. 858,876

Claims priority, application United Kingdom, Feb. 8, 1984, 8403314

Int. Cl.[4] B65H *23/06, 75/40*

U.S. Cl. 242—96 **2 Claims**



1. An apparatus for dispensing plastic film having a hollow core with an axial centerline comprising:

a first handle extending along the axial centerline of the core and fixed to the core for simultaneous rotation therewith;

a flexible handgrip covering said first handle configured for slideable rotation on said first handle; and

a second generally U-shaped handle with two members, a first resilient member having a centerline coincident with said centerline of said core and a second member having a centerline parallel to said centerline of said core, said first member mounted in said core to remain stationary and urging by its own resiliency against the internal surface of said core, while permitting axial rotation of said core and said second member arranged to provide a handgrip.

4,630,787

AIRFRAME AND PROPULSION SYSTEM

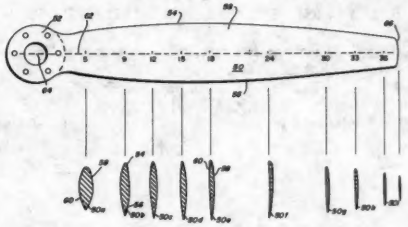
Daryl L. Middlebrook, 2612 Sisson Rd., Penn Yan, N.Y. 14527

Filed Nov. 18, 1985, Ser. No. 799,343

Int. Cl.[4] B64C *11/18*

U.S. Cl. 244—65 **1 Claim**

1. The combination of an aircraft comprising a high wing airframe, a power plant having a size and power specification of at least the 360 type horizontally opposed engine and a fixed blade propeller in drive relationship with said engine by means of a propeller hub, said propeller having two blades each being defined by a leading edge and a trailing edge and being formed with a front camber having a convex profile between said edges and extending continuously from said hub to the tip thereof, with the greatest degree of convexity of the said front camber immediately adjacent said hub, each of said blades being formed with a rear camber having a convex profile beginning from said hub to approximately the midpoint thereof



and for at least the last 15% of the blade, said rear camber profile being slightly concave beginning at approximately two-thirds of the distance from said hub, and being flat thereafter before assuming said convex profile.

4,630,788

AIRCRAFT LANDING GEAR, IN PARTICULAR FOR HELICOPTERS

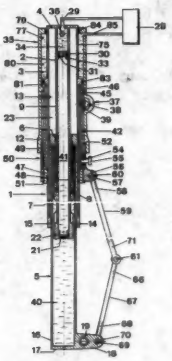
Jacques Veaux, Chatillon, and Michel Derrien, Versailles, both of France, assignors to Messier-Hispano-Bugatti (S.A.), Montrouge, France

Filed Oct. 29, 1984, Ser. No. 666,170

Claims priority, application France, Nov. 9, 1983, 83 17778

Int. Cl.[4] B64C *25/60*

U.S. Cl. 244—104 FP **17 Claims**



1. In an aircraft landing gear having a shock absorber, comprising:

a first and a second nested tube interconnected at one end by a common end plate, said first tube having a larger diameter than said second tube, and said first tube having on its outside lateral surface an outwardly projecting shoulder;

shock absorber means comprising said nested tubes and a first cylinder slidably mounted between said nested tubes and cooperating therewith;

a second cylinder disposed around said first tube having an annulus end plate around said first tube towards said one end and cooperating with said outwardly projecting shoulder to constitute therewith a jack and forming a pressure chamber therebetween, said pressure chamber being defined by said shoulder, said second cylinder, said first tube and said annulus end plate; and

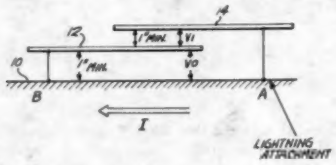
means connecting said pressure chamber to an hydraulic unit.

4,630,789

DIELECTRIC ISOLATED FUEL AND HYDRAULIC TUBES

Jerome C. Rosenberg, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 23, 1983, Ser. No. 535,300
Int. Cl.[4] B64D 37/32
U.S. Cl. 244—135 R **5 Claims**



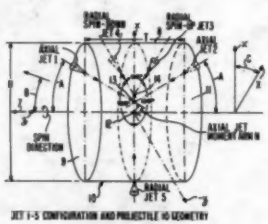
1. In an aircraft,
a fuel tank comprising walls of a non-metallic composite material such as carbon-epoxy or the like,
a metal conduit for fuel or a hydraulic liquid extending through said tank, and spaced from the tank and normally being surrounded by a fuel-air mixture within the tank;
means for electrically grounding said metal conduit to said tank; and
a dielectric insulator on said metal conduit of a thickness sufficient to prevent arcing between the tank and the conduit which might otherwise occur in response to a lightening strike on the tank.

4,630,790

VELOCITY AND ATTITUDE CONTROL FOR EXOATMOSPHERIC PROJECTILE

Richard L. Williams, Jr., Corona Del Mar, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Nov. 19, 1984, Ser. No. 672,550
Int. Cl.[4] B64G 1/26
U.S. Cl. 244—169 **17 Claims**



JET 1-5 CONFIGURATION AND PROJECTILE IG GEOMETRY

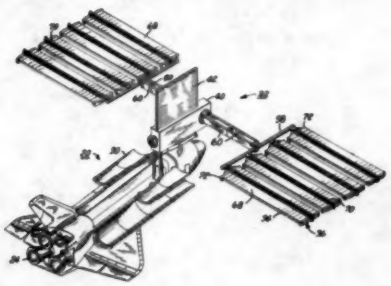
1. A system for controlling the velocity and attitude of an exoatmospheric projectile spinning about a spin axis and having a generally cylindrical outer shape consisting of a generally cylindrical periphery whose long axis is the spin axis, and front and aft generally circular faces located at opposing ends of the generally cylindrical periphery, said system comprising:
a first axial thruster positioned on the front face and having a force vector pointing inwardly through the projectile;
a second axial thruster positioned on the aft face and having a force vector pointing inwardly through the projectile; and
first and second radial thrusters, positioned on the generally cylindrical periphery and each having a force vector pointing inwardly through the projectile and intersecting at a common point that is offset from the spin axis; wherein
the spin axis can be reoriented in inertial space by firing the axial thrusters;
velocity can be added to the projectile in any direction, without a concomitant change in orientation of the spin axis, by firing a combination comprising at least one of the thrusters; and
the spin rate of the projectile can be changed by firing one of the radial thrusters.

4,630,791

TRANSPORTABLE SOLAR POWER STATION

Malcolm R. Chapman, Melville, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Oct. 28, 1983, Ser. No. 546,441
Int. Cl.[4] B64G 1/44
U.S. Cl. 244—173 **3 Claims**



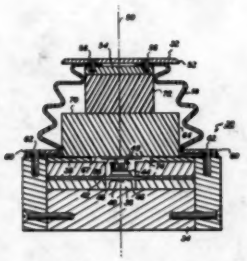
1. A solar operated power station for space operation transportable in a spacecraft having a hold with a deck, said power station comprising:
a chassis module containing electrical components and circuits of said station and drive system;
articulated base support means movably interconnecting said chassis and said spacecraft to guide the displacement of said chassis from said craft;
a pair of opposing extensible arms each movably connected at its inboard end to a corresponding side of said chassis for operation by said drive system and extensible outwardly from said chassis side when driven by said drive system, each of said arms having two members and each of said members having two links pivotally interconnected to each other to form a scissor linkage;
panel support tubes rotatably mounted transversely of each arm at an outboard end thereof, said panel support tubes being configured to be driven by said drive system when said arms are folded against the chassis sides; and
an assembly of solar panels supported by each of said panel support tubes, each of said solar panel assemblies being configured for packing in a stowed position and including extender means for depolying solar cells of said panel assembly from a retracted position adjacent said chassis to a fully extended position for intercepting rays of sunlight, said tubes being secured to said arms for rotation of said solar panel assemblies from a position pointing toward the deck of the hold during stowage to an outwardly extending position after said chassis has been positioned.

4,630,792

RAILWAY WHEEL DETECTOR

Klaus H. Frielinghaus, Rochester, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Jan. 10, 1985, Ser. No. 690,288
Int. Cl.[4] B61L *1/04*
U.S. Cl. 246—369 17 Claims



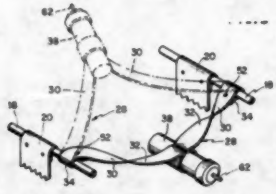
1. Apparatus for use on a railway track for detecting flanged wheels of railway vehicles on said track, said apparatus comprising a body of rigid material having an opening therein extending from a surface thereof, an electrical switch having a depressible plunger, said switch being disposed in said body with said plunger in said opening extending upwardly in the direction of said surface, means operated by the flange of a railway vehicle wheel for actuating said switch by depressing and releasing said plunger, said actuating means having a surface contacted by the wheel flange and spaced above the bottom of the cycloidal path of any point on the outer circumference of the flange as it moves along the track so as to move vertically and longitudinally along said track with said flange, said means including a body of compressible, resilient material supporting said contacted surface for said vertical and longitudinal movement, said compressible, resilient body having a surface on one end thereof bearing upon said body surface and bridging said opening, which one end surface moves vertically into contact with said plunger for depressing said plunger when said contacted surface is engaged by said wheel flange.

4,630,793

BABY BOTTLE BELT

Leslye Hunter, 36 Lakeland Ave., Congers, N.Y. 10920

Filed Nov. 7, 1984, Ser. No. 669,266
Int. Cl.[4] A47D *15/00*
U.S. Cl. 248—102 2 Claims



1. An improved baby bottle holder for attachment to a pair of generally horizontal, parallel side arms extending from about a supporting seat area for an infant, comprising:

a relatively short flexible belt made from a biasable material of a predetermined width and having opposed sides and opposed end portions,

symmetrical quick connect connecting means at said opposed end portions for removably securing said belt to each of said pair of side arms by encircling same, and biasable loop means, of the same material as said flexible belt disposed in the mid-area of said belt, for securely holding the body of a baby bottle in said loop means and being capable of removably gripping said body of said baby bottle; said connecting means being snap-on type connectors secured to said belt and positioned at each of said end portions, each said snap-on type connector including a female receptacle and a male projection capable of being removably secured by said female receptacle, said female receptacle and said male projection being sufficiently spaced apart from each other so as to allow said end portion to encircle said side arm;

said belt being of relatively short length and movable between a first position wherein said belt generally hangs downwardly out of the way and is slack, and said loop means is disposed below the horizontal plane of said pair of side arms; and a second position wherein said belt is generally raised to the vicinity of the mouth of the infant with little slack available; and said loop means is a loop member

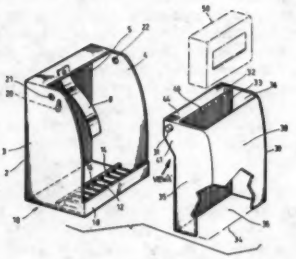
formed by pinch gathering and sewing said belt material together to form said loop member generally of a predetermined diameter size to tightly embrace a baby bottle in said mid-area of said belt; and said belt and said loop member being made of a unitary, one-piece elastic material.

4,630,794

SOAP HOLDER AND DISPENSER

Rodger L. Ross, P.O. Box 30, Alleyton, Tex. 78935

Filed Jan. 3, 1985, Ser. No. 688,554
Int. Cl.[4] A47K *5/08*
U.S. Cl. 248—309.1 12 Claims



10. A soap holder and dispenser, comprising:

a housing having a vertically disposed back panel adapted to be mounted on a wall surface, two side panels, and a bottom panel spanning a front portion of the bottom of said housing, the back edge of said bottom panel defining an opening in said housing;

a hopper having a substantially rectangular cross section, open at its top and bottom, pivotally suspended within said housing to swing between a forward position with said hopper bottom opening above said bottom panel and a back position with said hopper bottom opening over said housing opening;

a vertically disposed front panel laterally extending between said side panels and extending above the upper surface of said bottom panel a sufficient distance to form a hopper return stop; and

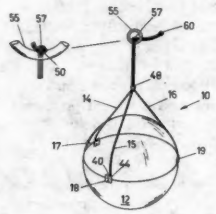
spring means interposed between said housing and said hopper biased to urge said hopper into said forward position.

4,630,795

SUSPENDABLE DISPLAY RECEPTACLE

Michael Kagan, 273 Moore Park Avenue, Willowdale, Ontario, Canada

Filed Mar. 3, 1980, Ser. No. 126,663
The portion of the term of this patent subsequent to Jul. 23, 1999, has been disclaimed.
Int. Cl.[4] A47H *1/10*
U.S. Cl. 248—318 **6 Claims**



1. A suspendable display unit comprising in combination; a display receptacle, in situ, suspended at, at least three horizontally co-planar spaced points, a plurality of supporting strands of uniform length connected to each others' upper ends, upsets integral with the material of said strands at the lower ends of said strands, means on said receptacle at said spaced points for securing said upsets thereto so as to reduce tensile stress tending to part said upsets from said strands, said means for securing said upsets each comprise essentially a tabulate body having a central portion secured against said receptacle at or in the vicinity of the rim of said receptacle, a bead projecting from and extending curvilinearly around at, at least one side and a base portion of said body and being also spaced from said receptacle, said securing means also including a socket for said upset, the end portion of said strand adjacent said upset being receivable against the slight outward flexure of at least the upper end of said bead under lateral pressure upon said end portion of said strand, into the space between said bead and said receptacle, and means on said strands for gathering said strands into a single multi-stranded suspension at any desired common point equidistant from said receptacle and securing said strands at said common point, and means for adjusting the effective length of said suspension and retaining it at said effective length from a location above said unit.

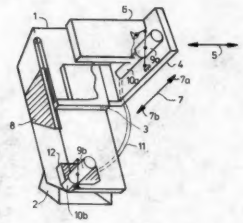
4,630,796

X-RAY APPARATUS COMPRISING A PART MOBILE THEREON

Harald Kayser, Wedel, and Walter Schmedemann, Tangstedt, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 22, 1985, Ser. No. 725,881
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1984, 3416000
Int. Cl.[4] F16M *3/00*
U.S. Cl. 248—648 **10 Claims**

1. An X-ray apparatus comprising:
a frame;
a first part moveable with respect to the frame;
a first piston/cylinder assembly having a chamber between the piston and the cylinder, said chamber being filled with a volume of fluid, said first assembly having one of the piston or cylinder attached to the frame and the other attached to the first part;
a counterweight moveable with respect to the frame;
a second piston/cylinder assembly having a chamber between the piston and the cylinder, said chamber being filled with a volume of fluid, said second assembly having one of the piston or cylinder attached to the frame and the other attached to the counterweight; and
a hydraulic duct for providing fluid communication between the chamber in the first piston/cylinder assembly and the chamber in the second piston/cylinder assembly;
whereby movement of the first part in a first direction relative to the frame changes the volume of fluid in the chamber of the first piston/cylinder assembly, the change in the volume of fluid in the chamber of the first piston/cylinder



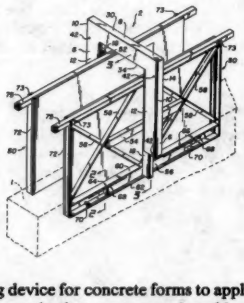
assembly produces an equal but opposite change in the volume of fluid in the chamber of the second piston/cylinder assembly, and the change in the volume of fluid in the chamber of the second piston/cylinder assembly causes movement of the counterweight in a second direction opposite to the first direction.

4,630,797

CLAMPING YOKE FOR CONCRETE FORMS

James A. Bomford, Box 215, Mill Bay, British Columbia, Canada (V0R 2P0)

Filed Feb. 11, 1985, Ser. No. 700,450
Int. Cl.[4] E04G *11/30*
U.S. Cl. 249—20 **14 Claims**



1. A clamping device for concrete forms to apply pressure to opposted form panels that contact and mold concrete, the device comprising:
a yoke to receive the opposed form panels;
the yoke comprising a cross member and arms at each end of the cross member extending downwardly to receive the panels;
each arm being of open channel section with the opening in each channel facing inwardly towards the other arm;
a pressure member corresponding to and within each arm reciprocable through the opening of the channel section of the arm to vary the pressure applied by the pressure member; and
means to force each pressure member outwardly comprising a fluid cylinder to force the corresponding said pressure member outwardly of its corresponding arm and inwardly with respect to the yoke, each said fluid cylinder including a piston, reciprocable within the cylinder and a piston rod

attached to the piston and extending outwardly of the cylinder, and

a pair of linking members pivotally attached to each end of the corresponding said fluid cylinder, one member of each said pair of linking members also being pivotally attached to the corresponding pressure member and the other link of each said pair also being pivotally attached to the corresponding said arm whereby extension of the piston rods of the cylinders acts to force the pressure members outwardly of their corresponding said arms.

4,630,798

METHOD AND DEVICE FOR ERECTING BUILDING STRUCTURES SUCH AS BRIDGES, USING PRE-FABRICATED CONCRETE BEAMS

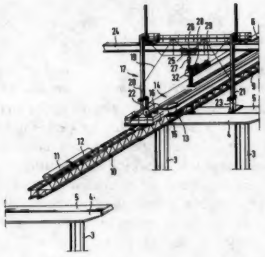
Eberhard Müller, Cologne, Fed. Rep. of Germany, assignor to Philipp Holzmann Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Division of Ser. No. 389,083, Jun. 16, 1982, Pat. No. 4,497,153. This application Nov. 1, 1984, Ser. No. 667,123

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124038

Int. Cl.[4] E01D *21/02*

U.S. Cl. 249—50 **13 Claims**



1. An apparatus for erecting a structure at a site using pre-fabricated beams, comrpising:

(a) a feed rigging in the associated work area of the structure, said feed rigging comprising:

(i) a form for forming the pre-fabricated beams; and

(ii) a support scaffolding operatively supporting said form;

(b) means operatively connected to said support scaffolding for continuously equalizing flexure of said support scaffolding during concretizing of the pre-fabricated beams; and

(c) means operatively proximate to said feed rigging for emplacing the pre-fabricated beams in their final position in the work area.

4,630,799

REMOTELY CONTROLLED OVERRIDE VALVE WITH CALIBRATION MEANS

John H. Nolan, 803 Voxpoint Cir., Delray Beach, Fla. 33444, and William A. Nolan, 3010 NE. 46th St., Lighthouse Point, Fla. 33064

Continuation-in-part of Ser. No. 531,848, Sep. 14, 1983, abandoned. This application Jun. 11, 1984, Ser. No. 619,571

Int. Cl.[4] F16K *31/02*

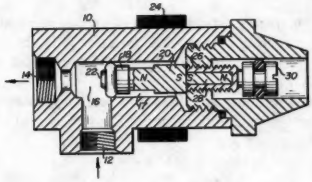
U.S. Cl. 251—129.18 **2 Claims**

1. A fluid control valve including a housing, a fluid inlet passage therein, and a fluid outlet passage in communication with said fluid inlet passage, said fluid control device comprising:

(a) a reciprocating valve capable of permitting, limiting, or precluding communication between said inlet and outlet passages, said valve comprising a ferromagnetic armature susceptable of receiving an electromagnetic induction of a magnetic axis along its axis of reciprocation, said magnetic axis generally corresponding to the longitudinal center of a fluid-tight chamber within said housing within which said valve may reciprocate, said valve having a variable flow-responsive integral first radial end face disposed within a region of communication between said inlet and outlet passages;

(b) a magnetic stator wound about said housing in the region of said reciprocating valve when said valve is in its open or limiting position, said stator, upon receipt of current, being capable of electromagnetic co-action with said armature valve to reciprocate said end face selectively out of or into closure across said region of fluid communication between said inlet and outlet passages, such closure and non-closure being dependent upon the direction of current flow through the windings of said stator; and

(c) magnetic bias and calibration means disposed within said housing and disposed co-linearly with and proximate to said reciprocating valve, near a radial end thereof opposite to said flow-responsive radial end of said valve, said bias and calibration means provided with an axis of magnetic polarity substantially co-linear with said magnetic axis of said reciprocating valve, said bias and calibration means further comprising external means for selectably advancing said flow-responsive first radial end face partially into said region of inlet-outlet communication to thereby correspondingly calibrate the level of fluid flow necessary to overcome the magnetic co-action between said bias and calibration means, and said reciprocating valve, to thereby precisely regulate the closure thereof,



whereby the electromagnetic co-action of said reciprocating valve and said stator may be used to selectively override and otherwise open or close said reciprocating valve in said region of communication between said inlet and outlet passages and, further whereby, said magnetic bias and calibration means will attract said reciprocating valve when the polarity of the magnetic axis of said bias and calibration means is the same as the polarity of the axis of said reciprocating valve and, conversely, will repel said reciprocating valve when the polarity of the magnetic axis of said calibration means is opposite to that of said reciprocating valve.

4,630,800

SEALING ARRANGEMENT FOR A SLIDE VALVE

Walter Brausfeld, Hanover, and Ernst-August Meyer, Algermissen, both of Fed. Rep. of Germany, assignors to WABCO Westinghouse Steuerungstechnik GmbH & Co., Hanover, Fed. Rep. of Germany

Filed Feb. 12, 1986, Ser. No. 828,926

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1985, 3505046

Int. Cl.[4] F16K *11/07*

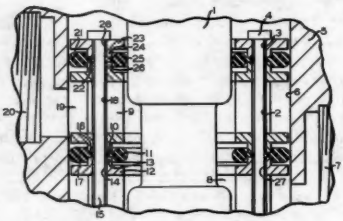
U.S. Cl. 251—324 **7 Claims**

1. A sealing arrangement, which can be located in a recess formed in a valve housing, to establish a seal between at least two fluid chambers formed in the valve housing, and having a movable member which moves in the recess, comprising:

(a) a first gasket and a second gasket, which are located in coaxial relationship with one another, and concentric with the recess of the housing;

(b) the first gasket and the second gasket are connected to one another by an annular connecting piece;

(c) the first and second gaskets are fixed in the recess of the housing by ring-shaped retaining elements, which are in contact with a portion of the end surfaces on each side of the connecting pieces of said first and second gaskets, which are located between the retaining elements;



(d) the connecting pieces consist of an elastic material;

(e) the connecting pieces being designed to be thinner in the axial direction, along the length of the recess, than the gaskets; and

(f) means for interconnecting the retaining elements with one another, and with the connecting pieces which pierce the connecting pieces.

4,630,801

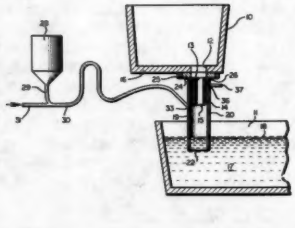
APPARATUS FOR ADDING SOLID ALLOYING INGREDIENTS TO MOLTEN MET' L STREAM

Daniel Rellis, Jr., Lansing, Ill.; Donald K. Fosnacht, Crown Point, and Charles R. Jackson, Dyer, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

Division of Ser. No. 731,077, May 6, 1985. This application Jan. 31, 1986, Ser. No. 824,517

Int. Cl.⁴ C21C *7/00*

U.S. Cl. 266—216 **6 Claims**



1. A device for use in adding solid particles of an alloying ingredient to molten metal, said device comprising:

a vertically disposable, elongated conduit having a lower end;

vertically disposable solid tubular shroud means for said conduit, said shroud means having walls located around the outside of and laterally spaced from said conduit to define an unfilled, annular space therebetween;

the cross-sectional area of the shroud's interior being greater than the cross-sectional area of the conduit's interior;

said shroud means having a lower end terminating below the lower end of said conduit, there being an unobstructed, columnar, vertical space within the shroud means and extending between said two lower ends;

said columnar space having a center line;

said conduit comprising means for directing a descending stream of molten metal downwardly into said columnar space substantially along the center line thereof and laterally spaced from the walls of said shroud means;

an injection port in said shroud means above said lower end thereof;

said injection port comprising means for directing a mixture of gas and solid particles into the interior of a descending stream of molten metal inside said shroud means, at a location below the lower end of the conduit and substantially above the lower end of the shroud means.

4,630,802

NOZZLE FOR INJECTION LANCE

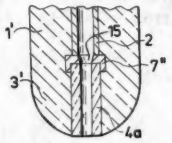
Björn Frykendahl, Hagfors, Sweden, assignor to IFM Development AB, Gripensas, Sweden

Filed Oct. 12, 1983, Ser. No. 541,054

Claims priority, application Sweden, Oct. 15, 1982, 8205880

Int. Cl.⁴ C21C *5/32*

U.S. Cl. 266—225 **15 Claims**



1. A nozzle construction for use in combination with an injection lance intended for injecting powderous material into a metal bath, freely in a metal bath or in a casting nozzle, the lance comprises both an outer pipe, made from ceramic, and an inner pipe, made from metal, in which said powderous material is intended to be transported all the way to the lance tip, at which tip the powderous material is intended to pass out through at least one nozzle, comprising an annular wall with a through passageway, in the lance tip, for said powderous material, said nozzle, which includes said annular wall and said through passageway being characterized by being made from a nozzle material with very high wear resistance, on the order of the wear resistance of highly purified Al_2O_3, and with a fusion point, which is substantially higher than the fusion point of a metal bath, into which the injection is to be made and in that said nozzle material differs from that of said lance tip, is tubular with an outer diameter substantially smaller than the average outer diameter of the lance tip, and said nozzle material constitutes at least the material of the nozzle wall immediately surrounding the nozzle passageway and the surface of said nozzle passageway, and said tubular nozzle material is separate from and is secured in and to the lance tip.

4,630,803

SUSPENSION-STRUT MOUNTING FOR INSTALLATION BETWEEN A SHOCK-ABSORBER STRUT OR SPRING STRUT AND A VEHICLE BODY SPRING-SUPPORTED WITH RESPECT TO THE AXLES, IN PARTICULAR OF A MOTOR VEHICLE

Hans Werner, Fellbach-Oeffingen; Frank Knothe, Stuttgart; Paul Graf, Koengen; Henning Wallentowitz, Aichwald; Hans-Hermann Keller, Notzingen, and Alfred Kist, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 414,389, Sep. 2, 1982, abandoned. This application Jan. 22, 1985, Ser. No. 693,051

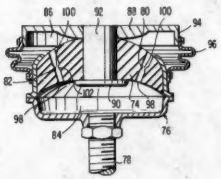
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1981, 3135043

Int. Cl.⁴ B60G *15/06*; F16F *9/54*

U.S. Cl. 267—8 R **25 Claims**

1. A suspension-strut mounting for installation between a shock-absorbing strut and a vehicle body spring supported with respect to axles, comprising at least one resiliently elastic

vibration-damping connecting means operatively connected with the vehicle body and with a piston rod of said strut, additional vibration damping means operable in parallel to said connecting means, said additional damping means including a



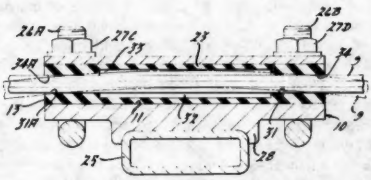
flow medium disposed in at least one space means, and wherein said connection and additional damping means operate to reduce vibrations in the same direction as, and independently of, the piston of the shock absorbing strut and even when said piston does not operate to absorb shocks.

4,630,804

LEAF SPRING CLAMP FOR SYNTHETIC MATERIAL LEAF SPRING

Donald G. Fesko, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 7, 1985, Ser. No. 689,364
Int. Cl.⁴ F16F *1/30*
U.S. Cl. 267—52 **23 Claims**



1. A leaf spring clamp assembly adapted to secure a leaf spring in position in a suspension system, said leaf spring clamp assembly comprising:

a rigid clamp base comprising a bottom wall and two side walls, said side walls being substantially parallel to each other and each extending upwardly from said bottom wall to form therewith a longitudinal channel, wherein an inward surface of at least one of said side walls fairs from each longitudinal end into a channel-widening concavity;

a resilient wedge insert adapted to be positioned within said longitudinal channel, comprising a wedge insert bottom wall adapted to lie adjacent to the clamp base bottom wall, and two wedge insert side walls being substantially parallel to each other and each extending upwardly from said wedge insert bottom wall to form therewith an inner longitudinal channel adapted to jacket said leaf spring laterally, wherein the inward surface of each said wedge insert side wall is adapted to contact said leaf spring along substantially the entire longitudinal dimension of said inner longitudinal channel, the outer surface of each said wedge insert side wall being adapted to lie adjacent and in substantial contact with the corresponding clamp base side wall to substantially fill said channel-widening concavity, said wedge insert further comprising a resilient support pad at each longitudinal end of said inner channel, said support pads being adapted to contact and support said leaf spring, said support pads extending within said inner channel laterally between said wedge insert side walls, the upper surface of said support pads being higher than the wedge insert bottom wall between said support pads to form a cavity, said cavity being substantially longitudinally centered within said leaf spring clamp and being adapted to accommodate leaf spring displacement within said leaf spring clamp upon bending of said leaf spring;

a substantially rigid clamp plate adapted to be fixedly attached to said clamp base to clamp said leaf spring between them within said inner channel; and

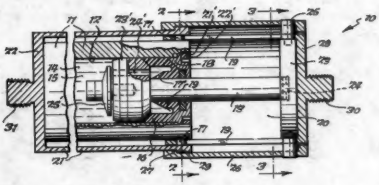
a resilient cover pad adapted to be positioned between said clamp plate and said leaf spring and to cooperate with said wedge insert to laterally encircle said leaf spring, said cover pad comprising a sheet of resilient material and a laterally extending resilient upper support pad at each longitudinal end of said sheet, said upper support pads being longitudinally spaced substantially the same distance as said wedge insert support pads, each providing a surface raised from the surface of said sheet, which raised surface is adapted to contact and support said leaf spring to form an upper cavity, said upper cavity being substantially longitudinally centered within said leaf spring clamp and being adapted to accommodate leaf spring displacement within said leaf spring clamp upon bending of said leaf spring.

4,630,805

TENSION-COMPRESSION LIQUID SPRING UNIT

Paul H. Taylor, Grand Island, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed Apr. 3, 1981, Ser. No. 250,846
Int. Cl.⁴ F16F *9/10*
U.S. Cl. 267—64.13 **16 Claims**



1. A liquid spring unit operable in both tension and compression comprising: a liquid spring including a cylinder, piston, compressible liquid in said cylinder and a liquid seal for said piston; sleeve means for telescopic mounting relative to said cylinder; a collapsible housing for mounting about said cylinder; first attachment means mounted relative to said sleeve means for attachment to a first external member; second attachment means on said housing for attachment to a second external member; means for permitting said housing to collapse when compression forces are applied to said first and second attachment means; means for preventing said housing from extending beyond a predetermined length when tension forces are applied to said first and second attachment means: and coupling means extending between said liquid spring and said collapsible housing for driving said piston into said cylinder when both compression and tension forces are applied to said unit.

4,630,806

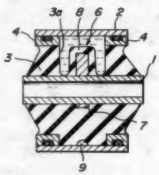
LIQUID-FILLED ELASTOMERIC BUSHINGS

Takuya Dan, and Michihiro Orikawa, both of Yokohama, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Apr. 5, 1985, Ser. No. 720,318
Claims priority, application Japan, Apr. 5, 1984, 59-66635; Feb. 15, 1985, 60-26440
Int. Cl.⁴ F16F *1/36*
U.S. Cl. 267—140.1 **6 Claims**

1. A liquid-filled elastomeric bushing comprising; inner and

outer sleeves coaxially arranged with each other, an elastomeric member disposed between the inner and outer sleeves and bonded only to the inner sleeve, plural liquid chambers formed in the axially middle portion of the elastomeric member at a given interval in the circumferential direction thereof, two separate intermediate rings interposed between the elastomeric member and the outer sleeve only at both axial end portions of the elastomeric member and bonded to the elastomeric member so that said intermediate rings can move in an axial direction to prevent rising of internal pressure inside said liquid chambers, each of said rings provided at its outer peripheral surface with a circumferential groove, an O-ring in each of the grooves, and at least one restricted passage formed on the outer peripheral in the middle portion of the elastomeric member and establishing communication between the liquid chambers.

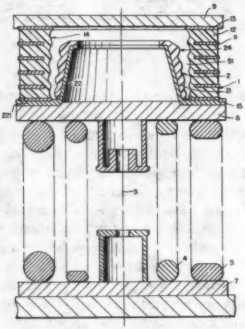


4,630,807

ELASTIC SUPPORTED MECHANISM

Gaston Gaudiau, Le Creusot, France, assignor to Societe Mte, Puteaux, France

Filed Feb. 15, 1985, Ser. No. 702,028
Claims priority, application France, Feb. 24, 1984, 84 02810
Int. Cl.[4] F16F *3/07*
U.S. Cl. 267—140.1 **16 Claims**



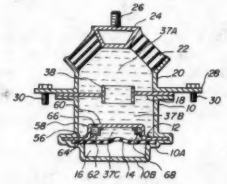
1. An elastic supported mechanism comprising a hollow elastic ring of generally cylindrical cross section, a plurality of intercalated rigid rings within said elastic ring respectively disposed about the axis of said elastic ring, said intercalated rings being spaced from one another along the axis of said elastic ring in substantially parallel relationship with one another, a stop fixedly disposed within a central bore of said elastic ring and having an outer peripheral surface normally spaced from the inner periphery of said elastic ring, said outer peripheral surface of said stop and the inner periphery of said elastic ring being configured such that when said elastic ring is subjected to an increasing pressure perpendicular to said axis thereof, said outer peripheral surface of said stop and the inner periphery of said elastic ring come progressively into contact with each other, thereby progressively increasing the rigidity of said mechanism in the direction of said load.

4,630,808

VIBRATION ISOLATING DEVICES

Takao Ushijima, Chigasaki, and Harumichi Yamazaki, Tokyo, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 687,337
Claims priority, application Japan, Dec. 28, 1983, 58-248908; Jun. 13, 1984, 59-121530
Int. Cl.[4] F16F *9/10*
U.S. Cl. 267—140.1 **5 Claims**



1. A vibration isolating device comprising; two frame bodies for joining to a vibration source side on one hand and a vibrating side on the other hand, a vibration-absorbing body interposed between said two frame bodies and composed of an elastomeric material, a hollow chamber mainly defined by an inner wall face of said vibration-absorbing body and containing a vibration-damping liquid therein, and first and second partition members dividing said hollow chamber into first, second and third liquid chambers; said first liquid chamber being defined by wall faces including at least vibration-absorbing body and first partition member; said second liquid chamber being defined by all faces including at least first and second partition members; each of said two partition members being provided with a restricted passage establishing communication between the adjacent liquid chambers; said restricted passage in said first partition member having a sectional area larger than that in said second partition member; and said second liquid chamber being provided with a pressure-reducing means.

4,630,809

VIBRATION ISOLATOR AND SHOCK ABSORBER DEVICE

Allen Duckworth, Middlefield, Conn., assignor to Teleco Oilfield Services Inc., Meriden, Conn.

Filed May 13, 1985, Ser. No. 732,928
Int. Cl.[4] F16F *3/08*
U.S. Cl. 267—141.1 **8 Claims**

1. A vibration isolator and shock absorber device having a longitudinal axis and including:

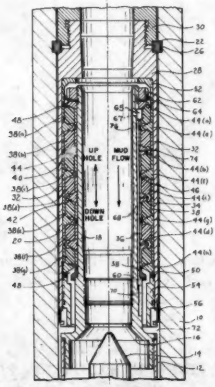
a plurality of ring elements in an array, each of said ring elements having an outer ring, an inner ring, and elastomeric material extending between and adhered to said rings, said inner and outer rings being substantially parallel to said longitudinal axis;

means for connecting said outer rings to an outer support member;

means for connecting said inner rings to an inner support member;

at least one reaction element positioned between an adjacent pair of said ring elements, said reaction element extending from one of said inner or outer rings into a space between the elastomeric materials of said pair of adjacent ring elements, said reaction element having reaction surfaces

facing the adjacent surfaces of each of said adjacent elastomeric materials; and



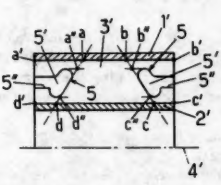
at least one of said reaction surfaces and surface of the elastomeric material adjacent thereto being differently contoured.

4,630,810

RESILIENT COUPLING WITH A LIMITED RANGE OF RADIAL MOVEMENT, MORE PARTICULARLY FOR A PULLED WHEEL ATTACHMENT

Jacques Pierrat, Paris, France, assignor to Hutchinson Societe Anonyme, Paris, France

Filed Apr. 25, 1985, Ser. No. 727,287
Claims priority, application France, May 2, 1984, 84 06800
Int. Cl.⁴ F16F *1/38*
U.S. Cl. 267—153 **5 Claims**



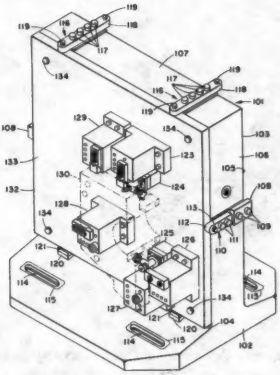
1. A resilient coupling with a limited range of radial movement of the type comprising two cylindrical sleeves one of which surrounds the other and between which is adhered a block of a resilient material, wherein in said block of resilient material are formed two grooves extending laterally endwise along the whole periphery of said block and being essentially symmetrical with each other with respect to the median transverse plane of the two cylindrical sleeves, each groove comprising a bottom portion of an elongate shape generally in the radial direction and which is continued laterally by a recess opening outwardly and having, in the radial direction, a smaller dimension than that of said bottom portion.

4,630,811

MODULAR FIXTURING APPARATUS

Carl D. Rudisill, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jul. 16, 1985, Ser. No. 755,643
Int. Cl.⁴ B23Q *3/18*
U.S. Cl. 269—118 **3 Claims**



1. A fixturing apparatus for positioning and holding a workpiece during a metal working operation comprising:

(a) a mounting plate for holding said workpiece in a known, repeatable position and orientation, said plate having a workpiece receiving face, a first plurality of threaded holes in said face in a pattern specific to said workpiece for defining the location and orientation of said workpiece on said plate and adapted to locate and hold workpiece support and clamp devices, wherein said first plurality of threaded holes includes holes having a counterbored, reamed, unthreaded upper portion and a lower threaded portion adjacent thereto, and wherein said plate has a second plurality of clearance, plate mounting holes; and

(b) a carrier apparatus for releasably and rigidly supporting said plate in an accurate, repeatable position thereon, said carrier apparatus comprising:

(1) a unitary molded filled epoxy resin system structure wherein the filler comprises crushed granite rock having a mixture comprising particle sizes in the range of from 0.08 mm to 16 mm in the major diameter and constitutes from 50% to 99% by weight of said filled epoxy resin system;

(2) at least one planar surface defined by adjacent perimeter faces substantially normal to each other end adapted to receive and hold said plate;

(3) a base having a base surface substantially normal to said planar surface;

(4) a plurality of non-movable plate locating stop means positioned at two adjacent perimeter faces of said planar surface and extending beyond said planar surface for engaging said plate;

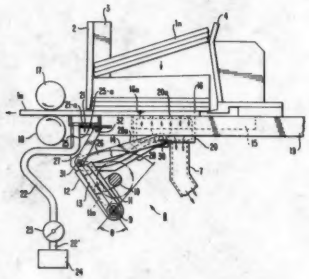
(5) pusher means positioned at perimeter faces of said planar surface opposing said stop means and extending beyond said planar surface for engaging and applying a force on said plate to urge said plate against said stop means; and

(6) a plurality of threaded holes in said planar surface corresponding to said second plurality of clearance plate mounting holes.

4,630,812
DELIVERY DEVICE FOR SHEET BODIES

Tadashi Yano, and Arifumi Okamoto, both of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1984, Ser. No. 634,863
Claims priority, application Japan, Aug. 5, 1983, 58-142428
Int. Cl.[4] B65H *3/64*
U.S. Cl. 271—132 6 Claims



1. A delivery device for sheet bodies comprising:

a kicker which is adapted to engage an end of a single sheet which is at a standby position, and move said sheet to a position away from said standby position, after which said kicker returns to said standby position;

a movable suction plate connected to a source of vacuum which engages at least a portion of said sheet and is movable in cooperation with said kicker to a predetermined position and stops at said position while said kicker continues to move said sheet, said suction plate being pivotably coupled to said kicker by means of linkage, a cam, a guide slot in said cam and a pivot pin attached to said linkage and arranged to follow the path of said slot for causing said suction plate to travel at a decelerated rate of speed as said suction plate approaches said predetermined position;

means for simultaneously moving said kicker and said suction plate away from said standby position and for moving said suction plate to said predetermined position and said kicker to said position away from said standby position; and

means for removing the suction applied by said suction plate when said plate reaches said predetermined position, whereby said sheet is moved by only said kicker after said movable suction plate reaches said predetermined distance.

4,630,813
METHOD OF AND DEVICE FOR DETECTING DISPLACEMENT OF PAPER SHEETS

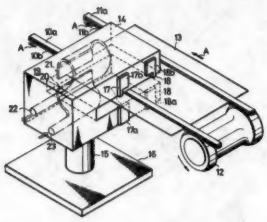
Toshiyuki Watanabe, Tokyo, and Noboru Yamada, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 31, 1984, Ser. No. 636,290
Claims priority, application Japan, Nov. 28, 1983, 58-222234
Int. Cl.[4] B65H *7/02*
U.S. Cl. 271—227 10 Claims

1. A displacement detection method of detecting the displacement of a paper sheet in transit along a conveyance line in a conveyance device, comprising:

detecting a leading edge of the paper sheet at a prescribed location of said conveyance line of the conveyance device for the paper sheet;

detecting a distance between one side edge of the paper sheet and a reference line set up traverse to the conveyance line based on a time interval after elapse of a prescribed time following the leading edge detection; and

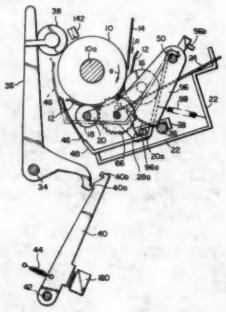


calculating a passing interval, inclination, and lateral shift to the paper sheet being transported based on the leading edge and distance detecting steps.

4,630,814
SHEET FEED APPARATUS FOR PRINTER

Toshio Kawakubo, Yokohama; Chuji Ishikawa, Kawasaki, and Shizuo Yokoyama, Atsugi, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,428
Claims priority, application Japan, Apr. 13, 1983, 58-55290; Apr. 13, 1983, 58-55291; Apr. 13, 1983, 58-55293
Int. Cl.[4] B65H *5/02, 5/04*
U.S. Cl. 271—272 15 Claims



1. A sheet feed apparatus for a printer which lays a sheet to print out data on a rotatable platen, comprising:

platen drive means for rotating the platen;

a deflector for guiding the sheet along a periphery of the platen;

a paper bail roller for pressing the paper against the periphery of the platen;

a guide member movable to face the periphery of the platen between the paper bail roller and the deflector;

guide member drive means for integrally holding said guide member and moving the guide member toward and away from the periphery of the platen;

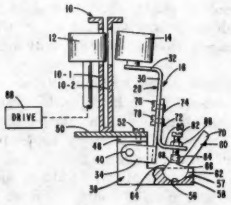
control means for controlling the guide member drive means such that, after the guide member is moved toward the periphery of the platen to face a substantially whole area of the periphery of the platen between the paper bail roller and the deflector, the paper guide member is moved away from the periphery of the platen when a leading end of the sheet guided from the deflector to the paper bail roller is held between the paper bail roller and the platen; and

the guide member drive means comprising a transmission mechanism for transmitting a rotation of the platen to the guide member.

4,630,815
QUICK RELEASING, PINCH ROLLER MECHANISM

Borge Petersen, Elmira, and Rickard P. Nally, Waterloo, both of Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 11, 1985, Ser. No. 807,563
Int. Cl.[4] B65H 5/06
U.S. Cl. 271—273 8 Claims



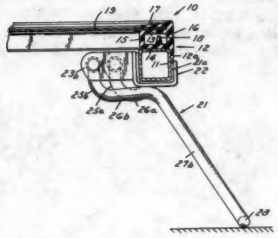
1. A quick-releasing, pinch roller mechanism comprising:
a base plate;
a document track upstanding from said base plate;
a driving roller mounted on one side of said document track to move documents in said document track in cooperation with a pinch roller;
a pinch roller;
a mounting block having fastener means for detachably mounting said mounting block on said base plate;
said mounting block having a mounting pin thereon and also having an arcuately-shaped recess therein;
a frame having first and second ends with said first end being pivotally mounted on said pin and with said pinch roller being rotatably mounted on said second end to enable said frame to be pivoted between an active position in which said pinch roller is in operating engagement with said driving roller and a retracted position in which said pinch roller is spaced from said driving roller to facilitate removing a jammed document from said document track;
an actuating lever having thereon an arcuately-shaped portion which is complementary in shape to said arcuately-shaped recess to enable said lever to be pivoted in said arcuately-shaped recess between first and second positions; and
coupling means secured to said frame and cooperating with said actuating lever to move said frame to said active and retracted positions when said actuating lever is moved to said first and second positions, respectively.

4,630,816
JOGGING APPARATUS

Charles C. Hill, Del Mar, Calif., assignor to James Virgil Watters, San Diego, Calif.

Continuation of Ser. No. 304,804, Sep. 23, 1981, abandoned. This application Mar. 19, 1984, Ser. No. 590,541
Int. Cl.[4] A63B 23/04, 5/18; A47B 3/00
U.S. Cl. 272—70 24 Claims

1. A jogging apparatus comprising
an annular frame defining an opening,
an elastomeric annular body bonded to said frame,
a mat bonded to said elastomeric body and covering the opening in said frame such that the mat is yieldingly supported on said frame,
said elastomeric body being hollow in cross section and comprises a top wall, a bottom wall and inner and outer side walls,
said elastomeric body, in the unloaded and undeformed state, assumes a configuration such that the inner wall and outer wall extend upwardly and outwardly and, in the deformed state with the mat attached to the top wall, assumes a configuration such that the inner wall and outer wall are deflected radially inwardly such that they are generally vertical and the mat is stretched such that the elastomeric body is self-sustaining and having a configuration such that it is free to deflect in shear deformation radially inwardly upon downward movement of the mat, and

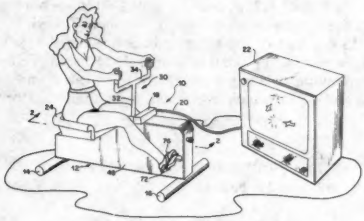


means for supporting said frame in spaced relation to a supporting surface.

4,630,817
RECREATION APPARATUS

James F. Buckley, Marlboro, N.J., assignor to Gym Bee Enterprises, Inc., Marlboro, N.J.

Filed Dec. 20, 1983, Ser. No. 563,657
Int. Cl.[4] A63B 69/16
U.S. Cl. 272—73 42 Claims



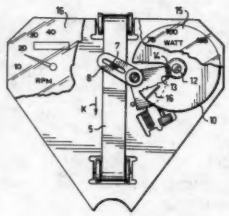
40. An exercise apparatus in combination with a video game apparatus which includes display means for displaying a video game including a movable cursor and for showing the progress of the video game and the degree of success of an operator, said exercise apparatus comprising a joystick for controlling said video game apparatus to cause movements of said cursor of said display means, said joystick being shiftable by an operator from a neutral central position; centralizer means connected to said joystick for yieldably holding said joystick in said neutral central position with sufficient resistance so as to require an operator to exert at least one pound of force on said joystick to move said joystick from said neutral central position during play of said video game; and switch means selectively operable by said joystick upon movement of said joystick from said neutral central position, said switch means being connected to said video game apparatus to control said video game apparatus to move said cursor along first and second directions on said display means, whereby an operator is encouraged to exert considerable physical energy to play the game.

4,630,818

TORQUE METERING DEVICE FOR A BICYCLE-TYPE ERGOMETER

Sulevi Saarinen, Ilmarinen, Finland, assignor to Tunturipyora Oy, Turku, Finland

Filed Oct. 22, 1985, Ser. No. 790,058
Claims priority, application Finland, Jun. 27, 1985, 852544
Int. Cl.[4] A63B *21/00*; A61B *5/22*; G01L *3/18*
U.S. Cl. 272—73 3 Claims



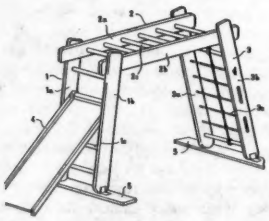
1. Torque metering device for a bicycle-type ergometer, in which ergometer the braking force is steplessly adjustable and in which the rotating movement is compensated by means of a flywheel (2), whereby the rotating movement of said flywheel is braked by means of a belt (5) or the like which is pressed against the outer periphery of the flywheel and moves limitedly with the flywheel, the movement of the belt with the flywheel being restricted by means of a spring member (6) connected to one end of the belt and the frame structure (1) of the ergometer, characterized in that the device comprises a pin member (7) fastened on said belt (5) and means (8) for rotating an indicator (10) which is journalled for rotation, that said rotating means (8) of the indicator are, essentially at the central portion thereof, journalled on the frame structure (1), and that one end of the rotating means (8) of the indicator is connected to said pin member (7), the other end being correspondingly secured on a shaft (12) of the indicator (10) in such a manner that the linear movement of the pin member (7) with the belt (5) moves one end of the rotating means (8) of the indicator around the journalling point (11) of said means, thus effecting a corresponding rotating movement of the other end of the rotating means (8), which movement turns the indicator (10).

4,630,819

COLLAPSIBLE PLAYGROUND DEVICE

Eliezar Levin, c/o Avi Nakash, 498 7th Ave., New York, N.Y. 11803

Filed Sep. 10, 1984, Ser. No. 649,187
Int. Cl.[4] A63B *17/00*
U.S. Cl. 272—113 5 Claims



1. A playground device, comprising:

a plurality of ladder sections including at least a first, a second and a third ladder section;

each of said ladder sections having a pair of parallel frame members and a plurality of rungs fixed to and extending transversely across said frame members in parallel spaced relationship to each other along the length of said frame members;

first attaching means for releasably attaching one end of said first ladder section directly to one end of said second ladder section with the two ladder sections at a desired angular position with respect to each other;

second attaching mens for releasably attaching the opposite end of said second ladder section directly to one end of said third ladder section with the latter two ladder sections at a desired angular position with respect to each other;

the free ends of each of said first and second ladder sections including a base bar of large surface area pivotably mounted to, and extending across, the parallel frame members of the respective section for supporting the playground device on the ground;

the pair of frame members of each ladder section being bars formed with flat, parallel, outer surfaces at each end where coupled to another ladder section;

each of the flat surfaces of one pair of frame members at each coupled end being formed with a first opening, and with a plurality of further openings arranged in a circular array;

each of the flat surfaces of the other pair of frame members at each coupled end being formed with a first opening alignable with said first opening of said one pair of frame members, and with another opening alignable with a selected one of said circular array of openings in said one pair of frame members;

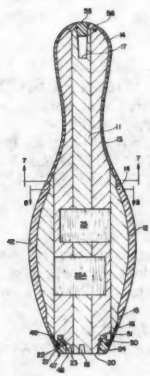
said first and second attaching means each comprising a pivot pin passing through each of said aligned first openings in the coupled ends of the frame members, and a locking pin passing through said selected one of the circular array of openings in said one pair of frame members and said aligned other opening in said other pair of frame members for locking the two ladder sections at each coupled end at a selected angular position with respect to each other.

4,630,820

PLASTIC COATED BOWLING PIN

Albert Bertozzi, 9 Harding Ave., East Providence, R.I.

Filed Dec. 5, 1984, Ser. No. 678,273
Int. Cl.[4] A63D *9/00*
U.S. Cl. 273—82 R 1 Claim



1. A composite bowling pin structure comprising a maple wooden core body member contoured to provide a head section at the top of said body, a neck section extending therefrom, a belly section extending from said neck station and a tapered bottom section at the bottom of said body; said belly

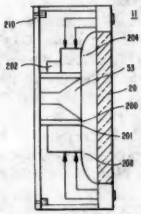
section being circumferentially recessed and said bottom section having a base wherein said body further includes a ledge between said recess and neck and a collar between said recess and bottom section, said pin having a main axis extending along its length, said ledge and collar being defined by a circumferential band whose surface is substantially parallel to the main axis of the pin, the thickness of a portion of said recessed belly section in a direction perpendicular to said main axis being greater than the corresponding thickness of said ledge, said collar being located adjacent the base of the bottom section and having a sharp corner at the junction with the tapered bottom section, said bottom section base having a recessed means for receiving a plug and being tapered downward from said collar to the base, a plug, said plug removably secured in said recessed means, and an outer covering of molded plastic consisting of high density, high molecular weight polyethelene bonded to said core body member, with the thickness of said plastic being greater in said circumferential recessed belly than the thickness of said covering over the remainder of said core, whereby, said ledge and said collar structurally support said covering of molded plastic through the difference of thickness between the thickness of said plastic in said circumferential recessed belly and the thickness of said covering over the remainder of said core body member, thereby, to provide protection to said wooden core body member of bowling ball shock and function of restitution to said wooden core.

4,630,821

VIDEO GAME APPARATUS INTEGRAL WITH AIRPLANE PASSENGER SEAT TRAY

Larry H. Greenwald, New York, N.Y., assignor to Aero-Vision Systems, Inc., New York, N.Y.

Filed Feb. 22, 1985, Ser. No. 704,202
Int. Cl.[4] A63F *9/22*
U.S. Cl. 273—85 G **18 Claims**



1. Video game apparatus to be employed by a passenger of an airplane comprising:

a tray mounted on the rear of an airplane seat in front of a passenger seat, said tray having an inegral hollow with a top rectangular aperture on a top surface facing said passenger;

a TV display screen positioned in said top rectangular aperture of said tray, said TV display screen having a viewing area no larger than 3″×3″ and a depth readily accommodated by said tray;

video game means located in said hollow of said tray and adapted to illuminate said TV screen when energized;

a plurality of control menas mounted on said top surface of said tray and coupled to said video game means for enabling said passenger to operate said game means;

cable coupling means positioned on said tray coupled to said video game means to actuate said video game means and said display for play by a passenger when a cable is inserted into said means;

a cable coupled to a head set and adapted to be inserted into said cable coupling means to actuate said video game means for play and to enable said passenger to receive audio information from said video game means via said headset when said cable is inserted;

brightness limiter means interconnected to said TV display menas, said brightness limiter means including means for sensing ambient light conditions and adjusting brightness exhibited by said TV display screen in response thereto;

panel means fitted in said top rectangular aperture of said tray overlying said TV display screen, said panel means occupying a substantial portion of the top surface of said tray; and

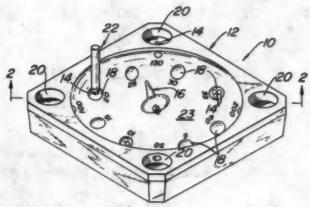
a lens assembly in optical communication with said TV display screen, said lens assembly enlarging information displayed on said TV display screen to a size facilitating play of said plurality of video games by passengers and projecting said enlarged information on said panel means.

4,630,822

GAME EMPLOYING TOP AND PLATFORM

Giovanni Massaglia, Hadden Heights, N.J., assignor to Jem Imports, Inc., Hadden Heights, N.J.

Filed Sep. 24, 1985, Ser. No. 779,739
Int. Cl.[4] A63D *3/00*; A63F *7/00*
U.S. Cl. 273—118 A **2 Claims**



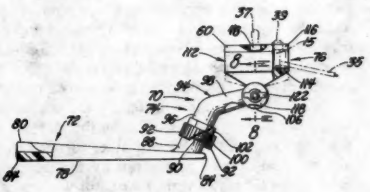
1. A top and platform game comprising a platform having a plurality of cavities in an upper surface thereof and a numerical value specified adjacent each of said cavities; a plurality of spherical members positionable on said platform; a spinable top having a lower surface for engaging the platform when the top is spun thereon, said top having surface means for engaging said spherical members about said platform; one of said spherical members having a different magnetic property from the other spherical members and indicator means for identifying said different magnetic properties.

4,630,823

VIDEO GAME CONTROL BOX HOLDER

Timothy L. Grant, 582 Kellogg, Apt. A, Ann Arbor, Mich. 48105

Filed Oct. 31, 1983, Ser. No. 547,032
Int. Cl.[4] A63B *71/00*; A63F *9/00*
U.S. Cl. 273—148 B **1 Claim**



1. A self-contained portable video game control box holder device for a control box having control means such as a fire button and a joy-stick or a ball control element, said device comprising base means, control box holder means and connecting means connecting said base means and said holder means, said base means being adapted to be itself supported in use of said device by separate support means such as the floor, a chair

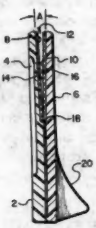
or the like, and said base means having peripheral spaced front and rear portions and spaced side portions, said connecting means being disposed at said front portion of said base means, said rear portion of said base means being disposed away from said base front portion and said connecting and holder means to the extent sufficient to enable the game operator to sit on said base portion with his buttocks, or to kneel thereon with his knees, without interference with said connecting and holder means, whereby at least the entire upper body weight of the operator including his buttocks is applied to said base to provide maximum stability of said device during use thereof, with no effort required of the operator except sitting or kneeling on said base means, said connecting means having means for adjusting said holder means laterally, vertically and angularly toward and away from the game operator while the operator is sitting or kneeling on said base, said holder means including a bottom wall to support a control box, spaced side walls and control box clamp means supported by and extending between said side walls, said clamp means including means for clamping control boxes of varying sizes, and means adapted to at least partially encircle the joy stick or ball control element to increase stability of the control box in said holder means, said device being constructed or relatively light-weight materials so as to be easily portable.

4,630,824

PLAYING CARD HOLDER

Richard F. Sweet, 1454 Briarglen Ave., Westlake Village, Calif. 91361

Filed Nov. 7, 1985, Ser. No. 795,933
Int. Cl.[4] A63F 1/10
U.S. Cl. 273—150 7 Claims



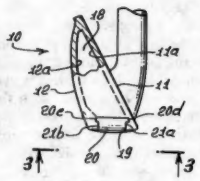
1. A holder for playing cards, comprising:
a base,
first and second generally arcuate plates formed from a stiff material extending generally upward from the base, the plates having opposed surfaces which mutually diverge from each other away from the base to form a tapered slot of substantially permanent dimensions and having an angular divergence within the approximate range of about 1°–8°, said slot having a generally arcuate bottom stop which is generally concentric with the plates, said plates being spaced apart from each other to releasably secure playing cards placed in the slot by the opposed lateral pressures of the plates against the cards with no substantial movement of the plates, the slot dimensions being adapted to accommodate the penetration of a small number of cards to a location near the stop, and of larger number of cards to locations further removed from the stop, the spacing between the plates being sufficiently small to hold cards placed throughout the slot against lateral slippage, and
means for holding the base in a generally upright position.

4,630,825

GOLF CLUBS

Glenn H. Schmidt, 1854 Los Encinos, Glendale, Calif. 91208; Howard F. Schmidt, S. Gate, and Glenn R. Seldman, Palos Verdes, both of Calif., assignors to Glenn H. Schmidt, Glendale, Calif.

Filed Dec. 17, 1984, Ser. No. 682,440
Int. Cl.[4] A63B 53/04
U.S. Cl. 273—167 H 14 Claims



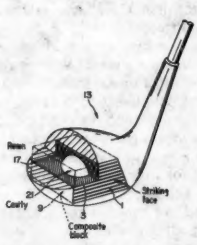
1. In a golf iron, the combination comprising
(a) means defining a hollow metallic head having a ball striking front face and a bottom surface,
(b) the head defining an opening between the hollow and the exterior, the opening located at the bottom of the head, the head having a heel and toe,
(c) and a closure for said opening having elongated, tongue and groove, linear sliding connection with said means, said closure located at the bottom of the head, the closure directly exposed along its length to the head hollow above the closure,
(d) said connection having a substantially T-shaped cross section, the closure being longitudinally elongated in the direction between said heel and toe, and said connection comprising two pairs of tongue and groove elements, each pair including a tongue element on the closure and a groove element on said head, the grooves having shoulders adjacent the head hollow to limit inward displacement of the tongue elements, and the closure having a lowermost outer surface everywhere spaced from said tongue and groove elements and flush with said head bottom surface at opposite sides of the closure lowermost outer surface, the closure entirely confined within the outer perimeter outline of the head.

4,630,826

GOLF CLUB HEAD

Susumu Nishigaki, Nagoya; Akio Ohkoshi, and Torao Aozuka, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 31, 1984, Ser. No. 636,353
Int. Cl.[4] A63B 53/04
U.S. Cl. 273—167 H 5 Claims



1. A golf club head having a striking face portion for striking a ball, said striking face portion being formed at least in part by

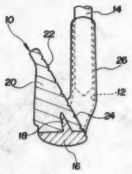
a composite block comprising a plurality of layers of thin ceramic plates and a plurality of layers of thin glass fibers or carbon fibers laminated in alternating layers and united into an integral composite block by a thermoset resin impregnated into said layers of glass fibers or carbon fibers.

4,630,827

GOLF CLUB HEAD

Minoru Yoneyama, Niigata, Japan, assignor to Yonex Kabushiki Kaisha, Niigata, Japan

Filed Mar. 19, 1985, Ser. No. 713,742
Claims priority, application Japan, Mar. 19, 1984, 59-38138
Int. Cl.⁴ A63B *53/04*
U.S. Cl. 273—169 **6 Claims**



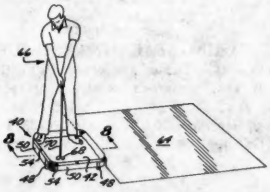
1. A golf club head of the iron type and comprising:
a sole formed of metal material and defining a lower end portion of the golf club head;
a rib formed on an upper surface of said sole integrally therewith, said rib extending from a heel portion to a toe portion of the golf club head along the longitudinal direction of said sole;
a hitting portion formed of carbon fiber reinforced resin material and having a substantially triangular shape in cross section, said hitting portion being integrally fixed over said sole with said rib being embedded within said hitting portion, lower edges of said hitting portion being coplanar with upper edges of said sole;
said sole and said hitting portion constituting an integral head body, said hitting portion occupying an area of from 70 to 85% of the total area of said head body taken along a transverse cross section substantially at the longitudinal center of said head body; and
a hosel for receiving a shaft therein and formed of metal material integrally with said sole, said hosel being connected to said sole at said heel portion.

4,630,828

SAND TRAP PRACTICE DEVICE

Arthur Lovin, 2609 Petaluma Ave., Long Beach, Calif. 90815

Continuation-in-part of Ser. No. 617,960, Jun. 7, 1984, Pat. No. 4,535,989. This application Aug. 14, 1985, Ser. No. 765,860
The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.
Int. Cl.⁴ A63B *69/36*
U.S. Cl. 273—176 FB **14 Claims**



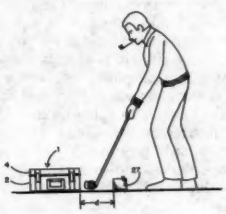
1. Apparatus for the practice of golf shots, comprising:
support means defining a perimeter enclosing an area large enough to allow a person to stand within said perimeter and swing a golf club therein, said support means including a frame having a plurality of short, vertical legs for resting said frame on a supporting surface and elevating said frame from said surface;
a piece of foldable sheet material supported by said support means to form a receptacle having substantially vertical sides approximately at said perimeter and a substantially planar bottom substantially coextensive with the area enclosed by said perimeter, the height of said sides being small relative to the horizontal dimensions of the enclosed area, said piece of foldable sheet material having an integral extension portion that, when unfolded, extends over at least one side of said support means to form an apron extending outwardly from the perimeter of said support means; and
a layer of particulate material contained in said receptacle;
said apron extending outwardly from the perimeter of said support means along at least one side of said receptacle by a distance sufficient to catch a substantial amount of the particulate material which is scattered from said receptacle as a result of a person swinging a golf club into said particulate material.

4,630,829

COMPACT GOLF SWING TRAINING AND PRACTICE DEVICE

Arthur A. White, P.O. Box 10396, Santa Ana, Calif. 92711

Filed Mar. 29, 1985, Ser. No. 717,966
Int. Cl.⁴ A63B *69/36*
U.S. Cl. 273—186 A **14 Claims**



1. A golf swing practice device for measuring the speed at which a golfer swings his club through a measuring zone, said practice device including at least two optical detectors, the respective optical axes of which define opposite ends of the measuring zone, means by which to supply said optical detectors with incident light, computational means interfaced with said optical detectors to measure the elapsed time for the golfer to swing his club through the measuring zone so as to obtain an indication of the speed at which the golfer swings his club therethrough, and detector circuitry interfaced with said optical detectors and comprising:
signal generating means interconnected with each of said optical detectors to generate output signals, the magnitudes of which are representative of the optical intensity of the incident light received by said optical detectors from said incident light supply means;
reference signal supply means providing first and second reference signals, the magnitudes of which are representative of minimum and maximum optical intensities in a predetermined range of optical intensities to which said optical detectors are responsive; and
limit detector means connected to receive and compare the magnitudes of the first and second reference signals from said reference signal supply means with the magnitudes of the output signals provided by said signal generating means, said limit detector means providing an output signal indicative of whether the intensity of the incident light at said optical detectors is above, below or within the

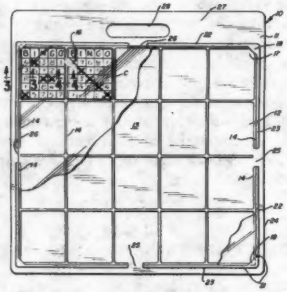
range of predetermined optical intensities established by said reference signal supply means.

4,630,830

BINGO GAME CARD HOLDER

Helen E. Gadd, 2200 North 73rd Ave., Elmwood Park, Ill. 60635

Filed Sep. 16, 1981, Ser. No. 302,828
Int. Cl.[4] A63F 3/06
U.S. Cl. 273—240 12 Claims



1. A bingo game card holder comprising:

means defining a base having a plurality of upwardly opening pockets adapted to receive one each a plurality of bingo game cards in laterally related disposition for viewing of the plurality of cards by a player;

light-transmissive cover means for covering the bingo game cards received in said pockets while permitting reading of the cards therethrough, said cover means defining an upper writing surface constructed to be marked by conventional erasable marking means to identify called numbers appearing on the cards in said pockets; and

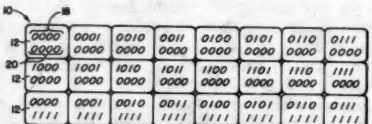
means at opposite portions of said cover means for releasably retaining said cover means on said base in overlying relationship to said pockets for retaining the cards therein.

4,630,831

TILE GAME

Cecine B. Stadden, 169 Giffin, Los Altos, Calif. 94022

Filed Apr. 19, 1985, Ser. No. 725,224
Int. Cl.[4] A63F 9/20
U.S. Cl. 273—292 7 Claims



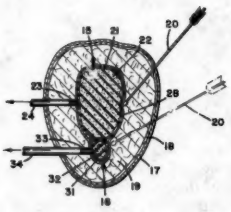
1. A process for playing a game, which comprises providing a first plurality of tiles bearing first indicia, a second plurality of tiles bearing second indicia and a third plurality of tiles bearing third indicia, the first, second and third pluralties of tiles being distinguishable into a set for each player, at least the first indicia having scoring significance, assigning a set of the tiles to each player, distributing at least some of the first plurality of tiles to each player, forming strings of the first plurality of tiles by each player in turn connecting a tile of the first plurality to a previsouly played tile of the first plurality by matching at least a part of the indicia between the tiles of the first plurality, drawing one of said second and third plurality of tiles after forming a string, validating a string in turn by attaching at least one of the drawn second and third plurality of tiles on the string, and cancelling the validated string of an opponent in turn by attaching at least one of the third plurality of tiles to the validated string, the players being required to play their playable tiles of the first plurality, but having discretion to withhold playing their tiles of the second and third plurality of tiles.

4,630,832

PROJECTILE SENSING TARGET

Dale A. Swanson, 6106 Birch Rd., Prior Lake, Minn. 55372

Filed Aug. 14, 1984, Ser. No. 640,924
Int. Cl.[4] F41J 5/04
U.S. Cl. 273—374 21 Claims



1. Apparatus for sensing the impact of a projectile, comprising:

a target area to be hit by a projectile;

a hollow projectile impenetrable member disposed to be impacted by a projectile which has hit said target area and having an enclosed chamber defined at least in part by a movable wall, the movable wall having a predetermined normal position and being constructed and arranged for movement to permit the chamber to be reduced in size upon impact by a projectile;

the hollow member having an air outlet from which a pulse of air can escape when the size of the chamber is reduced;

resilient means disposed within the chamber and operatively engaging the movable wall for urging the movable wall toward its normal position after impact by a projectile;

sensor means operatively connected to the hollow member for sensing a pulse of air and generating an indicator signal in response thereto indicating a score;

said hollow member and sensor means defining an open pneumatic circuit, said open pneumatic circuit having an air passage in air flow communication with atmospheric air to admit atmospheric air into the open pneumatic circuit as the resilient means urges the movable wall toward its normal position;

said sensor means including means for sensing said pulse of air escaping said circuit.

4,630,833

MOLDED RING SEAL WITH END SUPPORT RINGS

William G. Boyle, Dallas, and Ernest P. Fisher, Jr., Carrollton, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 459,058, Jan. 19, 1983, Pat. No. 4,483,543.
This application Sep. 7, 1984, Ser. No. 648,084
Int. Cl.[4] F16J 15/12
U.S. Cl. 277—188 A 32 Claims

1. A seal ring comprising end support rings having the same diameters, each support ring having a substantially flat outer end and inner end surfaces with openings therein, one support ring connected to each end of an elongate generally cylindrical resilient material portion by forming said material in said open-

ings and said portion in a mold, said resilient material portion having a cylindrical end section, a middle contoured ring section and another cylindrical end section wherein the outside of said contoured ring section curves radially outward from the outside of one of said cylindrical end sections to a larger diameter and curves radially inward from said larger diameter to the outside of the other end section, and the inside of said

contoured section curves radially inward from the inside of one of said cylindrical end sections to a smaller diameter and curves radially outward from said smaller diameter to the inside of the other cylindrical end section, and said inward and outward curves are blending radii tangent to lines forming angles of 5 to 30 degrees, preferably 15 degrees, with the outside and inside surfaces of said cylindrical end sections.

4,630,834

SEALING ASSEMBLY FOR UNIVERSAL JOINT

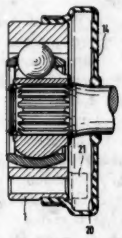
Karl-Heinz Müller, Wissen, and Alfons Jordan, Hennef, both of Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Continuation of Ser. No. 517,466, Jul. 26, 1983, abandoned. This application May 20, 1985, Ser. No. 736,415

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1982, 3227969

Int. Cl.⁴ F16J *15/52*

U.S. Cl. 277—212 FB **6 Claims**



1. A sealing assembly for a rotary universal joint including an outer joint member and an inner joint member arranged in torque-transmitting engagement with each other, with a shaft part in rotative driving engagement with said inner joint member, said sealing assembly comprising: an annular disc made of resilient material extending in sealing engagement between said inner joint member and said outer joint member; an annular collar on the radially outer edge of said annular disc secured in sealing engagement with said outer joint member; a central bore formed with a diameter smaller than the diameter of said shaft part having said shaft part extending therethrough in sealing engagement therewith; a reinforcing annular portion of enlarged thickness having a rotund cross-sectional configuration extending circumferentially around said central bore immediately adjacent thereto arranged in press-fitted engagement around said shaft part; and a plicated configuration formed in the region of the radially outermost portion of said disc to absorb deflecting forces applied to said disc as a result of relative movement between said shaft part and said outer joint member; said reinforcing annular portion being shaped to define a convexly curved outer configuration in abutting engagement with said shaft part and said shaft part being formed with a smooth continuous cylindrical surface along which said abutting engagement is maintained to effect a rolling contact between said reinforcing annular portion and said shaft part thereby to insure continued sealing engagement therebetween during relative movement between said shaft part and said outer joint member.

4,630,835

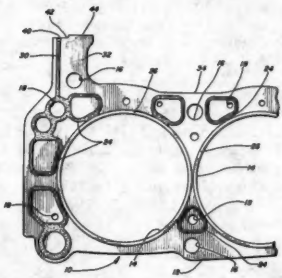
HEAD GASKET AND SEALING ASSEMBLY FOR A V-ENGINE AT THE INTERSECTION OF A BLOCK, A HEAD AND AN INTAKE MANIFOLD COVER

Robert F. Locacius, Lake Zurich, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.

Filed Mar. 13, 1986, Ser. No. 839,103

Int. Cl.⁴ F16J *15/12*

U.S. Cl. 277—235 B **8 Claims**



1. A sealing gasket comprising

an elongated main body portion having a pair of spaced ends and a pair of spaced sides,

an opening defined by said main body portion,

an elongated sealing bead disposed on said main body portion and terminating just short of a peripheral edge of said main body portion, and

an embossment on said main body portion, said embossment extending inwardly from said peripheral edge in line with said sealing bead and merging into said sealing bead.

4,630,836

DRILL CHUCK FOR USE IN PERCUSSION DRILLING

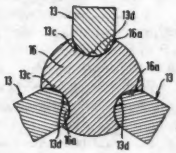
Josef Hunger, Olching, and Anton Neumaier, Fürstenfeldbruck, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Liechtenstein

Continuation of Ser. No. 589,874, Mar. 15, 1984, abandoned. This application Jan. 21, 1986, Ser. No. 820,833

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1983, 3310147

Int. Cl.⁴ B23B *31/04*

U.S. Cl. 279—19 **2 Claims**



1. A chuck for a drilling device operable for rotary drilling and rotary/percussion drilling, in the manner of a hammer drill, comprising axially extending chuck means forming an axially extending central opening for receiving a drilling tool, at least two radially adjustable clamping jaws elongated in the axial direction of said chuck means mounted in said chuck

means and each having a clamping surface facing inwardly toward the center of the drill opening, said clamping surfaces being arcuately convex in the direction transverse to the axial direction of said chuck means and having a radius of curvature, wherein the improvement comprises that each said clamping surface has the same radius of curvature, the most radially inward portion of said convexly shaped surface of each said clamping jaw has a notch formed therein extending in the axial direction of said chuck means for approximately the full axial length of said clamping jaw, said notch is V-shaped in the transverse direction, the included angle of said notch is in the range of 60° to 120°, said V-shaped notch having a pair of edges spaced apart with said edges being located at the transition from said notch to said arcuately convex clamping surface, and the spacing in the circumferential direction relative to the axis of said chuck means between said edges being in the range of 0.25 to 0.6 times the radius of the arcuately convexly shaped clamping surface whereby said clamping jaws can be used with the edges of said notches gripping the shank of a drilling tool or with the clamping jaws fitted in correspondingly shaped recesses in the shank of a drilling tool.

4,630,837

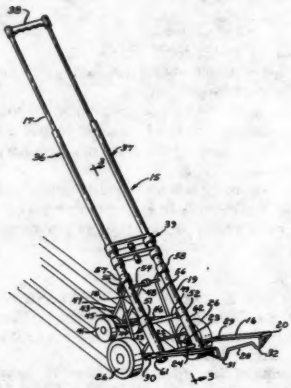
TWO-WHEELED CART WITH AUXILIARY WHEEL

Eugene A. Kazmark, 5 Remin La., Joliet, Ill. 60433

Continuation-in-part of Ser. No. 507,764, Jun. 27, 1983, abandoned. This application Jun. 14, 1984, Ser. No. 620,753

Int. Cl.⁴ B62B *1/04*

U.S. Cl. 280—47.2 **2 Claims**



1. A cart for transporting articles such as luggage and the like comprising a base portion for supporting an article to be transported, a handle portion extending upwardly from the base portion, an axle mounted on the base portion, a pair of wheels mounted on the axle, an auxiliary wheel frame movably mounted on the cart for movement between a storage position and a supporting position, and an auxiliary wheel mounted on the auxiliary wheel frame, the auxiliary wheel supporting the handle portion at an acute angle with respect to a supporting surface when the auxiliary wheel frame is in its support position whereby the cart is self-supporting, said auxiliary wheel frame including a generally U-shaped rod which is connected to the base portion for pivotal movement with respect to the base portion, a first support arm which is pivotally attached to the U-shaped rod, a second support arm which is pivotally attached to the base portion, pivot means mounted on one of the support arms for pivotally attaching said one support arm to the other support arm, the first and second support arms being movable between a first portion in which they support the auxiliary wheel frame in its support position and a second position in which the auxiliary wheel frame can move to its storage position, and means for releasably locking the first and second support arms in their first position, the base portion including a pair of parallel tubes, said axle extending between and being connected to said parallel tubes, said U-shaped rod being pivotally connected to said axle, a generally L-shaped rod attached to each of the parallel tubes and to the axle, a rod extending generally perpendicularly to the parallel tubes and being connected to said L-shaped rods, said second support arm being pivotally connected to said perpendicularly extending rod.

4,630,838

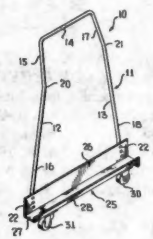
CARRIER FOR SHEET MATERIAL, WALL PANELING OR THE LIKE

Edward Stockton, 5202 Meyers Ave., Eureka, Calif. 95501

Filed Sep. 10, 1984, Ser. No. 648,985

Int. Cl.⁴ B62B *3/10*

U.S. Cl. 280—47.17 **7 Claims**



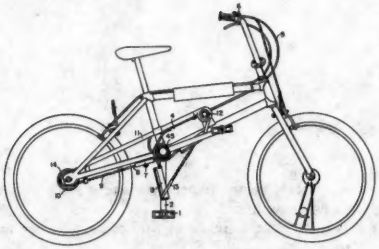
1. A carrier particularly adapted for transporting relatively large sheets of relatively thin material such as wall panelling, wallboard, composite board, sheetrock or the like comprising a generally inverted U-shaped handle defined by a pair of legs spanned at upper ends thereof by a gripping handle portion, each leg having upper and lower leg portions integrally joined to each other by a radius portion therebetween, said lower leg portions being disposed in a generally common first plane, said upper leg portions being disposed in a generally common second plane, said first and second planes being disposed at an included acute angle to each other as established by said radius portions, said lower leg portions being further disposed in upwardly converging relationship to each other, said lower leg portions having lower ends, means carried by said lower ends in spanning relationship thereto for edge-supporting thereupon relatively large sheets of relatively thin material, said edge-supporting means including an elongated bar of a generally L-shaped cross-sectional configuration defined by a generally vertically disposed spanning leg and a generally horizontally disposed relatively narrow supporting leg, means for securing said spanning leg to each of said leg lower ends, said elongated bar having opposite ends, means at one of said elongated bar ends for abuttingly contacting upright edges of sheets supported upon said narrow supporting leg when said narrow supporting leg is inclined to the horizontal thereby preventing sheets from sliding edgewise off said narrow supporting leg, said upright edges contacting means including an abutment plate disposed in generally transverse relationship to the longitudinal axis of said elongated bar, and means for eccentrically pivotally mounting said abutment plate relative to said elongated bar for movement of said abutment plate between a first inoperative position at which said abutment plate is disposed generally below a plane through an upper surface of said supporting leg and a second operative position at which said abutment plate is disposed generally above said upper surface plane.

4,630,839

PROPULSION MECHANISM FOR LEVER PROPELLED BICYCLES

Marn T. Seol, Rochester, N.Y., assignor to Alenax Corp., Rochester, N.Y.

Filed Jul. 29, 1985, Ser. No. 759,995
Int. Cl.[4] B62M *1/04*
U.S. Cl. 280—255 **34 Claims**



1. A propulsion mechanism for a lever propelled bicycle having a frame with main and rear shaft receiving portions, pedal lever assemblies including speed change devices, said assemblies being pivotally mounted in said main shaft portion, a rear axle mounted in said rear shaft portion, a rear wheel hub journalled on said rear axle, a pair of sprockets also journalled on said rear axle, a pair of one-way clutches for connecting said sprockets to said hub, said propulsion mechanism being characterized in that:

a chain of flexible material is entrained in a loop extending between each of said lever assemblies' speed change devices and around said sprockets enabling the pedal levers to execute see-saw motion as said levers are oscillated upwardly and downwardly by force applied to the pedals thereof;

a pair of pawl and ratchet mechanisms is provided in each of said one-way clutches, one of which effects locking of the clutch to impart forward motion when said pedal levers are depressed downwardly and the other of which effects release of said clutch to enable said bicycle to be rolled backwards; and

each of said speed change devices having a housing having a surface extending away from said main shaft to define the length of the lever arm of said pedal lever assemblies to said main shaft, a plurality of pawls pivotally mounted in said housing to move transversely to said surface and define a plurality of locations each at a different lever arm length, a speed selection bar for pivoting said pawls, and a link connected to an end of the chain and moveable along said surface between different ones of said locations.

4,630,840

VEHICLE HEIGHT ADJUSTING DEVICE

Mitsuhiro Masuda; Osamu Igarashi, and Keiichi Tokuyama, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 5, 1985, Ser. No. 804,937
Claims priority, application Japan, Dec. 7, 1984, 59-257613; Feb. 1, 1985, 60-16561
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—707 **3 Claims**

1. A vehicle height adjusting device comprising:

a vehicle height sensor for sensing the height of a vehicle;

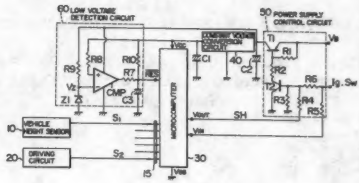
means for controlling the vehicle height which produces a vehicle height adjusting signal in response to the signal from the vehicle height sensor;

driving means for adjusting the vehicle height in response to the vehicle height adjusting signal;

constant voltage conversion means for converting a power supply voltage into a constant voltage and supplying the constant voltage to said vehicle height control means;

power supply control means for on-off controlling the supply of the power supply voltage in accordance with the turn-on and turn-off of an ignition switch;

means for stopping the power supply by a power supply stopping signal from said vehicle height control means



when a predetermined time elapses after the ignition switch is turned off; and

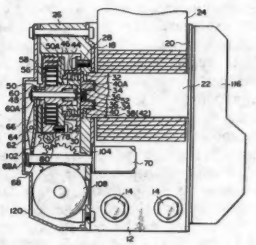
low voltage detecting means for stopping the operation of said vehicle height control means when the power supply is stopped and the output voltage from said constant voltage conversion means becomes lower than a predetermined reference voltage.

4,630,841

WEBBING TENSION ADJUSTING APPARATUS

Yuji Nishimura; Shinji Mori, and Teruhiko Kawaguchi, all of Niwa, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Jun. 3, 1985, Ser. No. 740,426
Claims priority, application Japan, Jun. 7, 1984, 59-85237[U]
Int. Cl.[4] A62B *35/02*
U.S. Cl. 280—806 **22 Claims**



11. A webbing tension adjusting apparatus for use in a seat-belt system designed to protect an occupant of a vehicle, said apparatus comprising:

(a) a frame secured to the body of said vehicle;

(b) a takeup shaft rotatably supported by said frame to wind up an occupant restraining webbing;

(c) a spring case supported by said frame;

(d) a spiral spring housed in said spring case and having its outer end retained by said spring case;

(e) a rotating shaft connected with the inner end of said spiral spring;

(f) a clutch plate connected to said rotating shaft to receive the biasing force of said spiral spring, said clutch plate being movable relative to said rotating shaft in the axial direction thereof;

(g) engagement means provided between said clutch plate and said takeup shaft to transmit the biasing force of said spiral spring to said takeup shaft;

(h) driving means for moving said clutch plate relative to

said rotating shaft in the axial direction thereof when an associated door is opened to thereby disengage said engagement means, whereby it is possible for said door to be smoothly opened, and the friction occurring between said webbing and the body of said occupant is reduced; and

(i) winding means for winding up said spiral spring by driving said spring case.

4,630,842

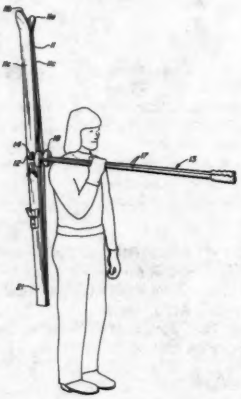
METHOD AND APPARATUS FOR CARRYING SNOW SKIS

Gary E. Roda, 367 Rugby Ave., Berkeley, Calif. 94708

Filed Aug. 2, 1985, Ser. No. 761,693

Int. Cl.[4] A63C *11/02*

U.S. Cl. 280—814 **5 Claims**



1. In combination with a snow ski having a top surface and a longitudinal axis, and a ski pole having a generally cylindrical tip portion, a ski carrier accessory comprising:

a ski pole tip receiver means rigidly and non-rotatably secured to the top surface of the ski, said means defining a generally cylindrical space sized to receive and retain the cylindrical ski pole tip potion in close co-axial relationship wherein the axis of the cylindrical space is generally perpendicular to the longitudinal axis of the ski and generally parallel to the top surface of the ski

whereby when the ski pole tip portion is inserted in the generally cylindrical space of the receiver means affixed to the top surface of the ski, the ski pole is effectively secured to the ski at a right angle to the longitudinal axis of the ski which orients the ski generally vertically along a skier's back when the ski pole is supported on the skier's shoulder.

4,630,843

BINDER

Boyd Willat, Los Angeles, Calif., assignor to Harper House, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 427,559, Sep. 27, 1982, abandoned. This application Nov. 28, 1983, Ser. No. 555,628

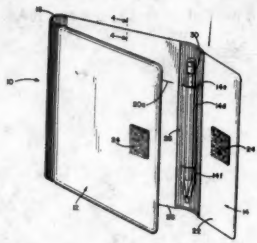
Int. Cl.[4] B42D *3/06, 3/12;* B32B *31/00;* F16C *11/00*

U.S. Cl. 281—30 **23 Claims**

1. A durable binder for holding papers and the like, said binder comprising:

an exterior plastic cover sheet;

an interior plastic cover sheet overlying said exterior cover sheet, said cover sheets being attached to each other along their respective peripheries and being foldable together to define relatively rigid panels separated by at least one flexible hinge panel, said hinge panel being characterized by a multitude of minute separated depressed areas in which said cover sheets are connected, said depressed areas being surrounded by intersecting raised areas, said



cover sheets being connected by heat sealing in said depressed areas; and

means for releasably retaining said pages between said panels.

4,630,844

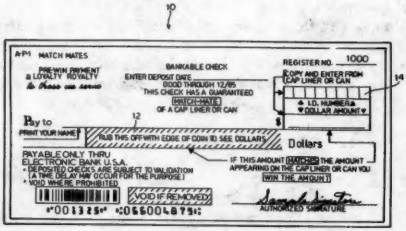
TWO-STEP BANK DRAFT

Seymour L. Troy, and Kenneth E. Mullenix, both of P.O. Box 5027, Ft. Lauderdale, Fla. 33310

Filed Jul. 24, 1985, Ser. No. 758,511

Int. Cl.[4] B42D *15/00;* A63F *1/18;* G06F *15/20*

U.S. Cl. 283—67 **6 Claims**



1. A sales promotional check for direct deposit or cashing at a bank as a bankable item comprising:

a preprinted sheet having at least a portion which conforms to a bankable bank draft and having a first dollar amount and means for receiving a second dollar amount and an identification number;

identifying information obtained from an outside commercial source affixed to the preprinted sheet to complete the bankable bank draft, the identifying information comprising the second dollar amount which matches the first dollar amount, and the identification number; and

verifying means for verifying that the identifying information affixed to the preprinted sheet was obtained from a proper source.

6. A method of providing a redeemable bank draft comprising the steps of:

providing a preprinted portion of a bank draft to a participant having a first dollar amount printed thereon and having spaces for a second dollar amount and an identification number;

placing the second dollar amount which matches the first dollar amount, and the identification number for verifying the second dollar amount, on an outside commercial source;

combining the second dollar amount and the identification number from the outside source with the preprinted portion of a bank draft to form a bankable bank draft; and

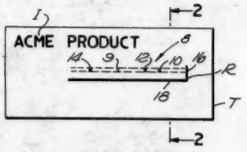
validating and paying the bankable bank draft.

4,630,845

AUTHENTICATION DOCUMENT SYSTEM

M. Duane Sanner, Irvine, Tex., assignor to Light Signatures, Inc., Los Angeles, Calif.

Filed Aug. 25, 1983, Ser. No. 526,185
Int. Cl.[4] B42D 15/00; G07D 7/00
U.S. Cl. 283—91 8 Claims



1. An authenticator device as for verifying authenticity comprising:

a sheet (T) of medium including a section (8) that exhibits an optically sensible characteristic of distinction to identify the authentication device; and

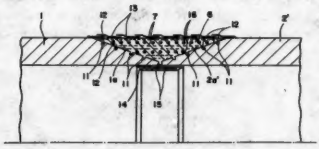
a magnetic-ink mark (R) on said sheet of medium including an elongate extension (18), said mark (18) being of a shape to optically specify boundaries of a predetermined portion of said section (8) on said sheet in the form of a scansion line (9) for optical sensing, said mark (R) further being selectively magnetized to record signals representative of said characteristic in said scansion line (9) whereby to identify the authentication device.

4,630,846

PIPE JOINT

Yoshinori Nishino, Yamato-takada; Masahiko Yamamoto, Nishinomiya; Tadayoshi Uda, Izumi, and Tomoyoshi Kanazawa, Kobe, all of Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

Filed Apr. 7, 1983, Ser. No. 482,840
Int. Cl.[4] F16L 47/02
U.S. Cl. 285—21 13 Claims



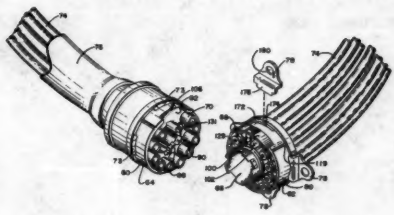
1. A pipe joint for connecting the opposed ends of two pipes to each other, said pipe joint comprising a connecting resin body extending over the outer peripheries of the opposed pipe ends and formed by the application of resin thereto, and a releasable tape wound on the outer periphery of said resin body while said resin is uncured, said tape having overlapping side edges with a clearance therebetween, said clearance permitting the outward flow of excess resin to smooth the outer periphery of said resin body.

4,630,847

MULTIPLE TUBE CONNECTOR

Brian J. Blenkush, Maple Grove, Minn., assignor to Colder Products Company, St. Paul, Minn.

Filed Oct. 5, 1984, Ser. No. 658,271
Int. Cl.[4] F16L 39/00
U.S. Cl. 285—29 22 Claims



1. A multiple tube connector, comprising:

(a) a first cylindrical connector housing having an axially extending, outer rim portion interconnected to a transversely extending wall portion, the wall portion having an aperture substantially coaxial with respect to the rim portion, a plurality of apertures of lesser diameter than the coaxial aperture being disposed in the wall portion circumferentially about a major portion of the coaxial aperture, the coaxial aperture including a plurality of inwardly projecting, evenly spaced apart and substantially identical spline members, the spline members defining a plurality of axially extending keyways therebetween;

(b) a second cylindrical connector housing substantially identical to the first cylindrical connector housing;

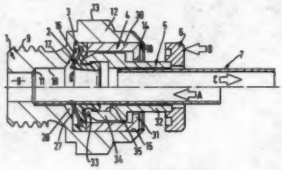
(c) a plurality of axially extending hollow male and female inserts removably positioned in at least some of the apertures of lesser diameter, a first end of the female inserts being adapted to receive a first end of the corresponding male inserts when the first and second connector housings are placed in an abutting relationship, a second end of the male and female inserts being configured for insertion into a tube; and

(d) a cylindrical locking spindle being rotatably retained proximate a first end in the first connector housing, the locking spindle defining proximate a second end a plurality of evenly spaced apart, outwardly projecting and substantially identical spline members, axially extending keyways being defined between the spline members, the locking spindle being interconnected by an elongated radially extending shaft to manually activated switch means for rotating the locking spindle between a first released position and a second locked position, the splines of the locking spindle cooperating with the key ways of the second connector housing to enable partial insertion of the locking spindle through the coaxial aperture of the second connector housing so as to place the first and second connector housings in an abutting relationship when in the first released position, the splines of the locking spindle cooperating with the splines of the second connector housing to lock the first and second connector housings together in an abutting relationship when in the second locked position, the rim portions of the first and second connector housings being cut away along a predetermined circumferential extent and the wall portions of the first and second connector housings being void of the apertures of lesser diameter along a corresponding extent to enable a predetermined amount of pivotal motion of the elongated shaft, the elongated shaft and the splines of the locking spindle cooperating with the first and second connector housings to provide a keying feature whereby proper matching of the respective male and female inserts is assured upon positioning of the first and second connector housings in an abutting relationship.

4,630,848
RELEASABLE COUPLING FOR TUBES OR PIPES

Michael Twist, Manchester, and Paul Mundy, Ashton-Under-Lyne, both of England, assignors to Hawke Cable Glands Limited, Lancashire, England

Filed May 29, 1985, Ser. No. 739,041
Claims priority, application United Kingdom, Jun. 13, 1984, 8415098
Int. Cl.[4] F16L *37/00*
U.S. Cl. 285—308 7 Claims

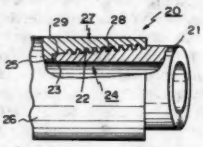


1. A releasable coupling for connecting a tube or pipe to a coupling body, said coupling providing a through bore with an entry for said tube and comprising a body providing a housing in which is received a seal of generally Z-shape in section and a clamping ring having a plurality of teeth for engagement with a tube received within the body, a retainer located in said housing to retain said seal and clamping ring therein, a releaser having an inner portion extending within said housing and an outer portion projecting from said body, said releaser being mounted and located by said retainer for limited axial movement relative to said body, said seal having a first outer annular flange portion engaging said housing, a second inner annular flange portion for engagement with said tube and said first and second flange portions extending in opposed senses, said seal having a web connected to and extending between said first and second flange portions with said web converging away from said entry, said clamping ring being in located engagement with said first flange portion of said seal with said teeth projecting radially inwards and overlying said web on the face opposed to said releaser, the arrangement being such that, in use with a tube received within said coupling, on moving said releaser axially inwards of said entry, said releaser acts through said seal to displace said teeth away from said tube into a clearance in said housing thereby releasing said tube for axial withdrawal from said entry.

4,630,849
OIL WELL PIPE JOINT

Kunihiro Fukui, Kawanishi; Minoru Nishihara, Kyoto; Toshiro Mase, Ashiya; Yoshiyasu Morita, Nara, and Hisakazu Kawashima, Kobe, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Mar. 27, 1985, Ser. No. 716,765
Claims priority, application Japan, Mar. 29, 1984, 59-62629
Int. Cl.[4] F16L *9/14*
U.S. Cl. 285—55 10 Claims



1. An oil well pipe joint having a metal-to-metal sealing portion, which comprises:

an externally-threaded pipe member including at the outer end a lip portion having a peripheral surface free from threads; and

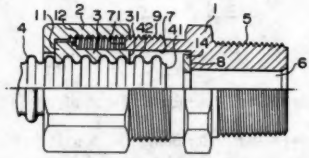
an internally-threaded pipe member including at the inner end an inner surface which corresponds to said peripheral surface and which is free from threads;

characterized in that a galling resistant layer exhibiting improved resistance to galling is provided only on said externally-threaded pipe member and at least on the threadfree lip portion thereof.

4,630,850
PIPE JOINT

Yoshimi Saka, Suzuka, Japan, assignor to Hitachi Metals, LTD, Tokyo, Japan

Filed Sep. 28, 1984, Ser. No. 655,736
Claims priority, application Japan, Sep. 30, 1983, 58-180637
Int. Cl.[4] F16L *21/06*
U.S. Cl. 285—322 13 Claims



1. Apparatus for sealingly coupling to a free end of a flexible corrugated tubing, the tubing free end having an axially directed face, the apparatus comprising:

a body having an axial, generally straight through-bore portion terminating at an inner annular shoulder with an axial sealing face, and a threaded outer surface;

a sleeve having an inner corrugated surface complementing the outer surface of the tubing to be coupled and having an axially straight outer surface radially opposed to said inner corrugated surface and disposed in sliding engagement with said axial bore portion, said sleeve also having at least one axial slit extending through the sleeve wall; and

a cap nut overlying said sleeve and having a threaded inner surface engaging said body outer threaded surface,

said cap further including a flange engaging said sleeve member for urging said sleeve into said axial bore portion toward said shoulder upon rotation of said cap,

said axial bore portion being tapered relative to said sleeve outer surface to converge in the direction toward said shoulder,

whereby during coupling operation rotation of said cap nut, acting through said sleeve member, will force the tubing end face into axial sealing engagement with said shoulder and simultaneously force said slit sleeve into radial pressing engagement with the outer surface of the corrugated tubing.

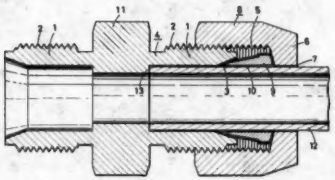
4,630,851
PIPE COUPLINGS

Susumu Ogawa, Osaka, Japan, assignor to Fujikin International, Inc., Osaka, Japan

Filed Mar. 30, 1983, Ser. No. 480,235
Claims priority, application Japan, Mar. 30, 1982, 57-46747[U]
Int. Cl.[4] F16L *19/08*
U.S. Cl. 285—341 3 Claims

1. A pipe coupling comprising a hollow main body having two ends, at least one of the ends having an externally threaded portion and a tapered portion on its inner surface; a cap nut having an internally threaded portion engageable with the externally threaded portion of the main body and a pipe pass-

ing bore formed in the center of its top wall; a sleeve provided on its outer surface with a tapered portion for engagement with said tapered portion of said hollow main body, said tapered portion of said sleeve for engagement with said tapered portion of said hollow main body having a smaller angle of inclination than the angle of inclination of said tapered portion of the main body, the sleeve being formed with a ceramic



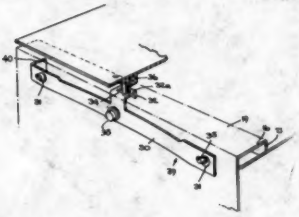
coating layer over its entire surface, the main component of said ceramic coating layer being selected from the group consisting of TiC, $A1_2O_3$ and TiN, the ceramic coated leading edge of the inner surface at said tapered portion of said sleeve biting into the outer surface of the pipe coupled therewith and forming a firm, sealing connection with said pipe without pipe seizure.

4,630,852

LATCHING MECHANISM

Robert M. White, Wilkes-Barre, and Rodney E. Brancher, Wyoming, both of Pa., assignors to InterMetro Industries Corporation, Wilkes-Barre, Pa.

Filed May 1, 1985, Ser. No. 729,217
Int. Cl.[4] E05C *19/06*
U.S. Cl. 292—87 **8 Claims**



1. A latching mechanism for latching and unlatching a panel movable relative to a stationary panel of a container, said latching mechanism comprising:

latch means secured to one of said panels;

means defining an opening in the other of said panels through which opening said latch means extends when said movable panel is in container-closing position;

a latch keeper including an elongate portion formed with a slot at each end thereof;

means removably mounting said keeper in operative position with said other of said panels, said keeper being mounted by said mounting means for movement between a latching position engaging and retaining said latch means when said movable panel is in container-closing position and a latch-releasing position releasing said latch means to permit said movable panel to move away from said stationary panel, said mounting means including a pair of headed studs fixed to said other panel, each stud being formed to enter and to disengage from one of said slots removably to position said keeper in said operative position, said studs and said slots being formed to permit manual shifting of said keeper from said operative position for disengagement from said other of said panels by disengaging said studs from said slots; and

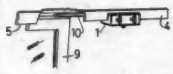
keeper actuating means operable to move said latch keeper, mounted by said mounting means, to said latch-releasing position, said mounting means and keeper cooperating to maintain said keeper in said operative position.

4,630,853

LOCK FOR SLIDING DOORS

L. James Bell, Willowdale, Canada, assignor to O. Ruben Pettersson, Toronto, Canada

Filed Mar. 29, 1985, Ser. No. 718,120
Int. Cl.[4] E05C *19/18*
U.S. Cl. 292—258 **1 Claim**



1. An auxiliary locking device (as recited in claim 2,) for a sliding door, comprising:

a blocking member having an upward-opening longitudinal channel near its inner side for receiving the inner frame member of the sliding door channel;

at least one clamping screw protruding through threaded hole(s) in the inner side of said blocking member into said longitudinal channel, for clamping said blocking member to said inner frame member of said sliding door with the outer portion of said blocking member protruding into the sliding door channel for blocking sliding of said sliding door, thereby preventing opening of the door past the blocking member location;

a rod projecting from the outer portion of said blocking member for positioning along said sliding door channel above said sliding door when said device is installed, for thereby preventing said sliding door from being lifted out of its channel for removal;

in which said outer portion of said blocking member is provided with an upward-opening channel, in which said rod is L-shaped, in which the rod portion constituting the base of said L-shape extends through a hole passing downwardly through said outer portion of said blocking member in said channel, and in which spring means are provided between said rod and said blocking member for biasing said rod into said channel, whereby said rod may be lifted from said channel against said spring force to swing said rod to project from said blocking member in either direction of said channel.

4,630,854

SECURITY DEVICE

Tor Persson, and Gerthy Persson, both of 594 Goddard Road, R.R. 1, Nelson, British Columbia, Canada (V1L 5P4)

Filed Aug. 30, 1985, Ser. No. 771,323
Int. Cl.[4] E05C *17/54*
U.S. Cl. 292—343 **4 Claims**

1. A security device comprising:

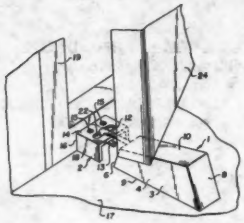
a wedge to contact a door to restrict opening of the door, the wedge including a first end and a second end and an upper surface, the upper surface sloping upwardly from the first end to the second end;

an anchor to be attached adjacent the door;

a slot in the anchor of predetermined length and width, the slot being generally aligned parallel to the door when attached adjacent the door;

a catch member attached to the wedge and comprising a limb extending longitudinally outwardly from the first end of the wedge with a hook on the limb, remote from the wedge, the hook having a length and width less than said predetermined length and width; whereby to restrict opening of the door, the hook is engaged in the slot, with

the hook and the limb lying widthwise of the slot, release of the wedge to enable opening of the door being achieved



by moving the wedge so the hook portion lies along the slot and can be removed through the slot.

4,630,855

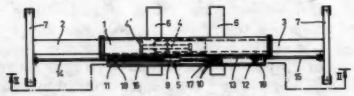
LIFTING YOKE FOR CONTAINERS

Anders Bjurling, Skultuna, Sweden, assignor to Dynatrans Technology Ltd., Douglas, Sweden

Filed Sep. 20, 1985, Ser. No. 778,434

Int. Cl.⁴ B66C *1/00*

U.S. Cl. 294—81.21 **4 Claims**



1. A lifting yoke for containers consisting of a central beam (1) and two extending beams (2, 3), which are coaxial with the central beam and guided therein for reciprocating movements and are equipped with means (7, 8) for gripping containers, one of said extending beams (3) being so arranged as to be capable of telescoping into the other (2), characterized in that a guide tube (4) coaxial with the extending beams (2, 3) and having a smaller cross-sectional area than the extending beam (3) with the smallest cross-sectional area thereby to produce a light yoke weight is arranged to connect the two extending beams in the position in which they are extended away from each other and, when they are telescoped one into the other, to guide one beam (3) into the other (2), and in that the central beam (1) and the extending beams have light weight telescoping reinforcing and load distributing means to increase the yoke capacity to bear transverse forces comprising beams of hexagonal cross-section with resulting transfer of transverse forces in the central section of the beam.

4,630,856

TWISTLOCK OPERATING MECHANISM

Jan A. Peeters Weem, Gresham; David E. Krueger, Mulino, and Dennis P. Graham, Milwaukie, all of Oreg., assignors to Hyster Company, Portland, Oreg.

Filed Jan. 31, 1985, Ser. No. 697,039

Int. Cl.⁴ B66C *1/42*

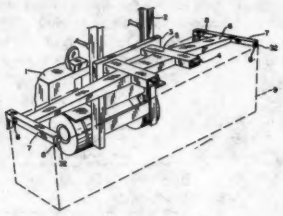
U.S. Cl. 294—81.53 **14 Claims**

1. In a spreader, having a plurality of remotely rotatable twistlocks located for insertion in mating connectors on a container, a twistlock operating mechanism comprising:

(a) a means of directing pressurized fluid from a source to;

(b) the first of a plurality of fluid motors connected in series, each operatively coupled to rotate a twistlock; and

(c) a valve means, responsive to twistlock insertion in the corresponding mating connector for selectively blocking



the flow of fluid through the motors if a twistlock is not properly inserted.

4,630,857

STORAGE APPARATUS FOR MOTOR VEHICLES

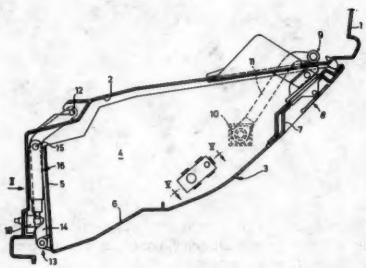
Hansjurgen Zweiniger, and Horst Willenbrock, both of Cologne, Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 12, 1985, Ser. No. 808,134

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1984, 3445211

Int. Cl.⁴ B60R *7/06*

U.S. Cl. 296—37.12 **8 Claims**



1. A storage apparatus carried inside interior panels of motor vehicles, having a storage container which is open toward the interior of the panel and which is movable forwardly and downwardly through a guide mechanism arranged in parallelogram fashion by overcoming dead center in a closed position flush with the panel wherein the storage container is spring-mounted by way of lever arms articulated on the panel at one end and on the storage container at the other end and which is operatively connected to a spring and shock absorber arrangement cooperating with the guide mechanism and which is lockable on stop means in an opened position projecting from the panel, characterized in that two forward, laterally outer lever arms and a rear, triangularly shaped lever arm disposed outside of and parallel to the approximately vertical rear wall of the storage container are provided, and a spring and bell-crank lever arrangement engages below on a support point mounting on the panel and above on a transverse bar of the triangularly shaped lever arm.

4,630,858

MULTI-PURPOSE PASSENGER MOTOR VEHICLE, ESPECIALLY STATION WAGON

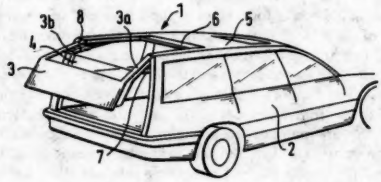
Ulrich Bez, Poecking, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Munich, Fed. Rep. of Germany

Filed May 29, 1985, Ser. No. 739,023

Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420349

Int. Cl.[4] B60J 1/18

U.S. Cl. 296—146 15 Claims



1. A multi-purpose passenger motor vehicle, comprising a rear door including a rear window means lowerable into the door, roof means including a movable rear roof section, against which the closed rear window means abuts, vehicle side walls devoid of any roof connection between the rear upper sections thereof, and means pivotally connecting the rear door in the upper rear end areas of the vehicle body side walls including two arms serving as window frame means for the rear window means, and wherein the upper pivotal ends of the two arms are unconnected with each other to define an open area with an area occupied by the movable roof section when the window is lowered and the roof section is moved.

4,630,859

WIND DEFLECTOR ARRANGEMENT FOR A MOTOR VEHICLE ROOF

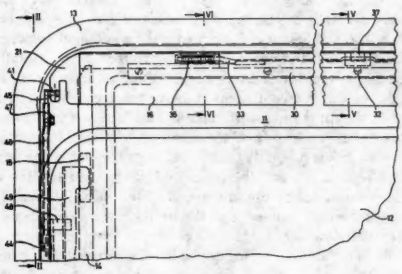
Horst Bienert, Gauting, and Georg Kohlpaintner, Martinsried, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Apr. 10, 1985, Ser. No. 721,907

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1984, 3415361

Int. Cl.[4] B60J 7/22

U.S. Cl. 296—217 21 Claims



1. A wind deflector arrangement for a motor vehicle roof having a roof opening and a sliding cover for closing the roof opening comprising a wind deflector arranged along the front edge of the roof opening and mounted so as to pivot around an axis extending transversely to a longitudinal axis of the vehicle, and spring means for swinging said wind deflector out when the sliding cover is opened and cam means for swinging said wind deflector in when the sliding cover is closed, said cam means being displaceable as a function of the movement of the cover and interacting with at least one lever arm, said lever arm being connected with the wind deflector via a driving arrangement, wherein the wind deflector comprises a body formed at least partly of an as extruded, extruded profiled part side edges of which are covered by attachment to the body of a respective end piece which, at the same time, forms a part of the driving arrangement connecting the lever arm with the wind deflector.

4,630,860

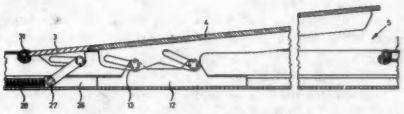
VEHICLE ROOF COVER AND WIND DEFLECTOR

Arpad Fuerst, Munich, and Alfons Lutz, Emmering, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co, Fed. Rep. of Germany

Filed Jul. 10, 1985, Ser. No. 753,571

Int. Cl.[4] B60J 7/22, 7/04, 7/047

U.S. Cl. 296—217 20 Claims



1. A vehicle roof having a cover which is mounted and arranged for being rearwardly slidable from a closed position into an open position along guide rails extending on longitudinally opposite sides of a roof opening, as well as having a wind deflector forming a part of the roof located in front of the cover that is mounted and arranged for being automatically raised and lowered as a function of the position of the cover, said wind deflector and cover closing the roof opening and being pivotable about an axis extending transversely relative to the sliding direction of the cover, wherein the cover is also mounted and arranged for being tilted out into a ventilating position in conjunction with said wind deflector in a manner whereby the cover and wind deflector together effectively form a single panel arrangement, the wind deflector being at least partially raised along with the tilting of the cover.

4,630,861

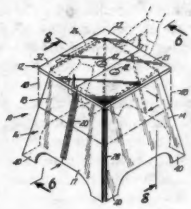
FOLDABLE STOOL

Reed E. Henschel, Rte. 4, Box 33, Sundance, Wyo. 82729

Filed Oct. 28, 1985, Ser. No. 792,303

Int. Cl.[4] A47C 4/08

U.S. Cl. 297—44 4 Claims



1. In connection with a folding stool movable between an upright and a folded condition, said stool having:

first and second nonfolding side walls,

a folding top wall including first and second nonfolding top half-walls and hinge means connecting these top half-walls to each other,

first and second folding end walls, each including first and second nonfolding half-walls and each including hinge means connecting its first and second end half-walls to each other,

hinge means conneting each first half-wall to said first side wall, and

hinge means connecting each second half-wall to said second side wall; the improvement wherein:

A. the top wall is provided with

(1) a lip extending outwardly around the outer horizontal periphery of the top wall as the top wall is viewed when the stool is in its upright condition with the top half-walls lying in a common horizontal plane, and

(2) a shoulder below and spaced inwardly of said lip around the outer periphery of the top wall;

B. said lip is so positioned as to lie in supported relation to the uppermost surface of each of said side walls and each of said end half-walls when said stool is in its upright condition;

C. said shoulder is so positioned as to lie in inward-movement-preventing contact with the uppermost inner edge of each of said side and end half-walls when said stool is in its upright condition;

D. each of said top half walls is movable into face-to-face relation with its hinged-together counterpart and said side walls being movable into parallel, spaced-apart relation to each other and in adjacent, closely spaced relation to said folded end walls to accomplish movement of said stool to said folded condition;

E. each of said end half-walls is movable into face-to-face relation with its hinged-together counterpart to lie entirely between the side walls;

F. said top wall shoulder is effective around substantially the entire periphery of the top wall to be in contacting relation with the top inner edge surface of each of said side walls and each of said end walls when said stool is in its upright condition;

G. those side-wall-contacting portions of the top wall shoulder in contact with each of said side walls each define a vertical plane coincident with substantially the entire top inner edge surface of such side wall when the stool is in its upright condition;

H. those end-wall-contacting portions of the top wall shoulder in contact with each of the folding end walls each define a vertical plane coincident with the top inner edge surface of its contacted end wall over a central hinged portion of such end wall when said stool is in its upright condition, only so much of said end-wall-contacting shoulder portions as are in adjacent relation to the side-wall-contacting shoulder portions being relieved as is needed to allow those portions of the top wall shoulder adjacent the hinged edges of the first and second end half-walls of each end wall to initially clear the tops of those end-walls as the stool is moved from upright toward folded condition; and

I. said top wall shoulder is relieved by providing four ramps which are formed by cutting away all four ends of the side-wall-contacting portions of the top wall shoulder by a dimension at least approximately equal to the depth of the shoulder and cutting away all four adjacent end-wall-contacting portions of the top wall shoulder so that such ramps taper into the end-wall-contacting portions of the top wall shoulder at a point at least approximately eight times the thickness of the shoulder from the side walls when the stool is in an upright condition.

4,630,862

DENTAL CHAIR

Minoru Watanabe, Kyoto, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

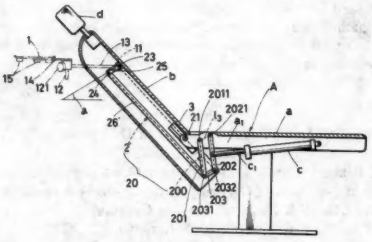
Filed Dec. 6, 1984, Ser. No. 678,661

Claims priority, application Japan, Dec. 10, 1983, 58-190749[U]

Int. Cl.[4] A47B *39/00*

U.S. Cl. 297—167 **3 Claims**

1. A dental treatment chair including a seat, a backrest tiltably secured to the seat and a first drive means for tilting the backrest, said chair including a unit table having therein on the inside top thereof a first link rotatable with respect to the backrest in a vertical plane and journalled in the backrest by a first pin, said first link being kept always constant in the angle of incidence to the axis of the first link even when the backrest tilts so as to journal a horizontal rotary arm in the first link through a longitudinal shaft and to hold at the end of the arm the table rotatable in a horizontal plane around a support shaft, whereby even when the backrest tilts, the table is arranged to be held horizontally such that an operator is enabled to take a position convenient for making access to various dental tools on the table and to take a position opposite the table, a lower end of said backrest is journalled in the lower end of a frame member of the seat through a transverse shaft, while one end of a second link is pivotally connected to the swing end of the first link through a second pin and the other end of the second link is pivotally supported through a third pin by the rear the rear end of the frame member of the seat, and a first segment between the first and second pins and a second segment between the transverse shaft and the third pin are made equal in length and horizontal so as to compose a substantially parallel first linkage of the first link, frame member and backrest in the manner that the backrest is tilted with respect to the seat by cooperation between the actuation of a drive means for tilting the backrest and the action of the parallel first linkage to move the unit table up and down in the state of the table being kept



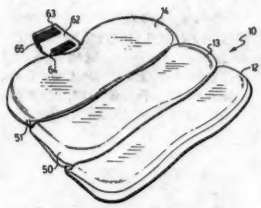
horizontal, third and fourth links of equal length with each other are pivotally supported by fourth and fifth pins, respectively, a fifth link equal in length to a third segment between the fourth and fifth pins is spanned between and pivotally connected to the lower ends of the third and fourth links through sixth and seventh pins to compose a parallel second linkage of the third and fourth links and a fifth link and a frame member on the underside of the seat and wherein one end of the seventh link is pivotally connected to swing end of the first link to a second pin and the other end of the seventh link is pivotally connected to the lower end of the third link and to one end of the fifth link through the sixth pin so as to compose a substantially parallel third linkage of the first, seventh and fifth links and the backrest inside the backrest in such a manner that the third and second linkages which are parallel, are joined by the fifth link to form a double parallel linkage and also where the backrest has a groove formed in the side thereof such that the transverse shaft fixed to the rear end of the frame member of the seat is slidably fitted into the groove to permit tilting of the backrest with respect to the seat and to permit vertical movement of the table when the table is kept horizontal under the cooperative control of the actuation of the drive means for tilting the backrest of the action of the double parallel linkage, and of the tilting of the transverse shaft with respect to the groove.

4,630,863

PORTABLE SEAT

Frank L. Roberts, Thornhill, Canada, assignor to Bio-Support Industries Ltd., Toronto, Canada

Filed Sep. 9, 1985, Ser. No. 773,716
Int. Cl.[4] A47C *27/16*
U.S. Cl. 297—219 **9 Claims**



1. A portable seat comprising:
a rear portion having a forwardly facing transverse bounding margin;
a front portion having a rearwardly facing transverse bounding margin;
a mid portion having transverse bounding margins facing the respective bounding margins of said front portions and said rear portions;
each said portion consisting essentially of a rigid, resilient, unitary support layer and a foam layer overlaying each said support layering;
each said portion being completely surrounded by an upholstered finish, and
hinge means joining said portions along the length of the bounding margins thereof,
wherein each said support layer of each said portion has a central upstanding ridge which extends to its forward transverse bounding margin,
and wherein the lateral edges of each said support layer and the rear edge of the support layer of the rear portion are upturned,
and wherein the rearward transverse edge of the support layer of said rear portion has a V-shaped cut out therein centrally located thereon.

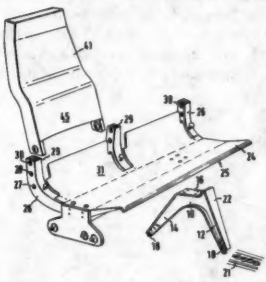
4,630,864

AIRCRAFT SEATS

Ian C. Toll, Poole, England, assignor to Futaire Limited, Poole, England

PCT No. PCT/GB84/00403, § 371 Date Jul. 2, 1985, § 102(e) Date Jul. 2, 1985, PCT Pub. No. WO85/02384, PCT Pub. Date Jun. 6, 1985
PCT Filed Nov. 23, 1984, Ser. No. 751,051
Claims priority, application United Kingdom, Nov. 23, 1983, 8331260
Int. Cl.[4] A47C *3/00*; B64D *11/06*
U.S. Cl. 297—232 **13 Claims**

1. A seat frame assembly for an aircraft seat comprising a single laterally extending spar, at least one leg assembly to support the spar from the aircraft floor, a plurality of generally J-shaped seat supports extending from one side of the spar at laterally spaced locations with their cranked rear ends directed upwardly to locate pivoting seat backs and seat cushion support means between the or each pair of seat supports, characterised in that:
(a) the seat supports extend unilaterally from the spar, and the spar and seat supports are formed with a skin of carbon fibre reinforced plastics and reinforcing cores of expanded material that prevent buckling of the spar and seat supports under load;
(b) the spar is of generally rectangular section with its width greater than its depth to present a flat upper surface;
(c) the apex of the or each leg assembly is formed with a cut-out in which the spar is located; and



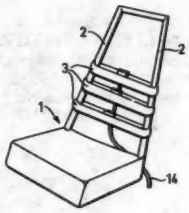
(d) the seat cushion support means is a diaphragm supported upon the spar and the seat supports.

4,630,865

BACKREST ADJUSTING DEVICE

Wilgot Ahs, Koppom, Sweden, assignor to Erress, Hagfors, Sweden

Filed Nov. 23, 1983, Ser. No. 554,766
Claims priority, application Sweden, Nov. 24, 1982, 8206689
Int. Cl.[4] A47C *3/00, 7/02*
U.S. Cl. 297—284 **14 Claims**



1. A device for adjusting the backrest of a seat, comprising:
first and second plates movable relative to one another, said first plate being connected by an adjustable belt to a rigid part of a first lateral edge of a seat back, said second plate being connected by the adjustable belt to a rigid part of a second lateral edge of the seat back, said first and second plates being oriented such that a side of the first plate substantially faces a side of the second plate;
spring means for adjusting the length of the adjustable belt between the lateral edges of the seat back;
a supporting member located outside of a space defined between said first and second plates for receiving means for pressing said plates into locking engagement with one another and with the supporting member.

4,630,866

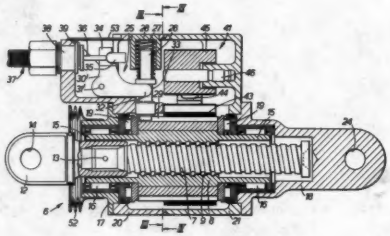
SEAT RECLINE UNIT

Arthur H. McFarlane, Basildon, England, assignor to Morse Controls Limited, Basildon, England

Filed Mar. 11, 1985, Ser. No. 710,392
Claims priority, application United Kingdom, Mar. 14, 1984, 8406697
Int. Cl.[4] B60N *1/02*; F16H *29/20*; F03G *1/00*
U.S. Cl. 297—361 **17 Claims**

1. A recline unit for the inclinable back rest of a seat, comprising a cooperating screw and nut means, mounting means for mounting the cooperating screw and nut means between

the back rest and a fixed part of the seat so that the recline unit is interposed as a strut therebetween, the cooperating screw and nut means when so mounted being responsive to the back rest being inclined such that relative axial movement occurs between the cooperating screw and nut means so varying the length of the strut in accordance with the inclination of the back rest with attendant relative rotational movement between



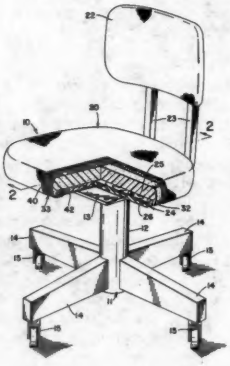
the cooperating screw and nut means, and torsion spring means strained in response to the cooperating screw and nut means making said relative rotational movement and operative to effect reverse relative rotational movement between the cooperating screw and nut means with attendant reverse relative axial movement thereof to cause opposite variation in the length of the strut and so return the back rest to a lesser inclination.

4,630,867

ELECTROSTATIC DISSIPATIVE CHAIR

Barron J. Gulliver, Sturgis, Mich., assignor to Harter Corporation, Sturgis, Mich.

Filed Mar. 20, 1985, Ser. No. 714,006
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—452 **10 Claims**



1. A seating device capable of dissipating an electrostatic charge received thereby, comprising:

a supportive substrate having an upper surface;

electrically conductive flexible mesh substantially enveloping said upper surface of said supportive substrate, said conductive mesh being suitable for receiving an electrostatic charge;

separate electrically nonconductive cover means substantially entirely contiguous to said electrically conductive means, said cover means being physically independent from said conductive mesh; and,

means for electrically communicating said conductive mesh with an electrical ground;

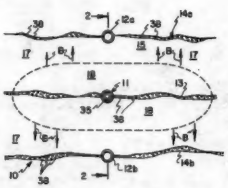
wherein said supportive substrate presents a seating region, said conductive mesh being continuous throughout substantially the entire said seating region.

4,630,868

PROCESS FOR SOLUTION MINING

Arfon H. Jones, and Sidney J. Green, both of Salt Lake City, Utah, assignors to Terra Tek, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 38,311, May 11, 1979, abandoned. This application Jan. 16, 1981, Ser. No. 225,847
Int. Cl.[3] E21B *43/26*
U.S. Cl. 299—4 **8 Claims**



1. An improved method for in situ mining of a subsurface aggregate mineral deposit of low permeability comprising the steps of:

locating a subsurface aggregate mineral deposit suitable for in situ mining;

forming an injector well bore into said mineral deposit;

packing off, at a desired depth within said mineral deposit, a portion of said injector well bore where fracture will be undertaken;

positioning stress sensing means appropriate to said injector well bore, such stress sensing means for sensing pressure changes that result when said injector well bore is fractured for resolution into principal components for mathematically determining the direction of a major fracture induced in said injector well bore;

fracturing said mineral deposit around said injector well bore by introducing a disintegrating solution under pressure as the pressure medium within the packed off area in said injector well bore, that also dissolves the aggregate bonding to open the deposit along the fracture;

determining from the surface pressure changes sensed by said stress sensing means the direction of the major fracture emanating from said injector well bore;

positioning at least one production well bore alongside said injector well bore such that a line through said production and injector well bores will be essentially normal to said major fracture, said production well bore being spaced appropriately from said injector well bore such that a flow of solution can be established between said well bores;

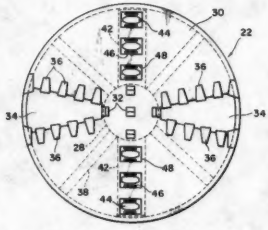
packing off and fracturing, utilizing a disintegrating solution under pressure as the pressure medium, said production well bore at essentially the same depth as said injector well bore fracture, which disintegrating solution also dissolves the aggregate bonding to open the deposit along the fracture;

after withdrawal of the disintegrating solution, introducing a leaching solution into said mineral deposit to dissolve minerals therefrom, and withdrawing that solution pregnant with dissolved minerals therefrom for further refining; and by the steps set out above, locating the direction of major fracture emanating from each injector well bore formed into said mineral deposit for placement of production wells to practice said solution mining process.

4,630,869
SHIELD TUNNELING MACHINE

Toshio Akesaka, Yokohama; Kenju Suzuki, Mobara, and Toshio Sumi, Kodaira, all of Japan, assignors to Kabushiki Kaisha Iseki Kaihatsu Koki, Tokyo, Japan

Filed Sep. 18, 1985, Ser. No. 777,312
Claims priority, application Japan, Dec. 25, 1984, 59-271910
Int. Cl.[4] E21D *9/08, 23/03*
U.S. Cl. 299—33 6 Claims

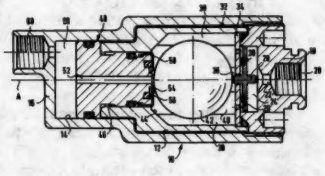


1. A shield tunneling machine comprising:
a tubular shield body;
a partition wall provided in the shield body;
a rotary shaft supported rotatably by the partition wall and extending along the axis of said shield body;
a cutter head disposed on the front end of the rotary shaft and including a first cutter provided with a plurality of cutter bits for excavating soft layers and a second cutter provided with a plurality of roller bits for excavating hard layers;
a mechanism for rotating said cutter head through said rotary shaft; and
a mechanism for moving straight one of said first and second cutters forward and backward relative to the other to place them alternatively between a first position where one is projected more forward than the other and a second position where the said one is retreated more backward than the said other.

4,630,870
PRESSURE REGULATOR FOR HYDRAULIC VEHICLE BRAKING SYSTEMS

Manfred Knab, Rhens, Fed. Rep. of Germany, assignor to Lucas Industries public limited company, Birmingham, England

Filed May 31, 1985, Ser. No. 739,686
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1984, 8418527[U]
Int. Cl.[4] B60T *8/14*
U.S. Cl. 303—24 A 3 Claims

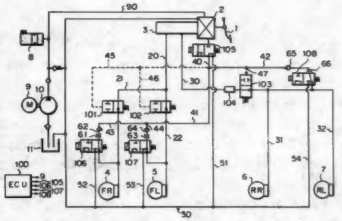


1. A pressure regulator for hydraulic vehicle braking systems, comprising
a casing which has an inlet and a valve chamber connected to the same as well as an outlet,
a valve seat which is arranged in the valve chamber at the entrance of a passage leading to the outlet, and
a valve member which is arranged in the valve chamber so that brake fluid can flow around it and which is movable relative to the casing in response to deceleration of said casing from an inoperative position clear of said valve seat to a positiom against said valve seat,
a partition defining an antechamber between the inlet and the valve chamber and having a central aperture,
wherein a movable barrier member is disposed in the antechamber and includes a stem which is movable through the central aperture against the valve member, brake fluid being adapted to flow around or through said barrier member which is movable in response to the flow from an inoperative position remote from the valve member until its stem hits the valve member at least approximately in the direction of movement thereof.

4,630,871
ANTISKID CONTROL DEVICE

Yuzo Imoto, Kariya; Hideo Wakata, Nagoya; Toshihiro Takei, Okazaki; Yoshiyuki Hattori, Toyoake, and Yoshihisa Nomura, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 30, 1985, Ser. No. 792,927
Claims priority, application Japan, Oct. 31, 1984, 59-227970
Int. Cl.[4] B60T *8/04*
U.S. Cl. 303—113 9 Claims



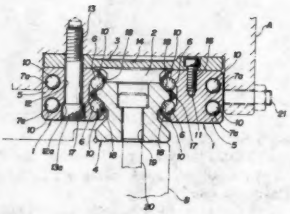
1. An antiskid control device controlling pressure in wheel cylinders of a brake system provided in a vehicle for preventing the vehicle from skidding through locking of the wheels thereof, said device comprising;
means for discharging pressurized fluid,
a main line system having a main line connecting said discharging means to wheel cylinders, and an open-close means for opening and closing said main line,
means for switching said open-close means to normally open said main line, and to close said main line when a locking condition occurs in the wheels of the vehicle,
a subline system having a subline connecting said discharging means to the wheel cylinders, a first control valve opening and closing said subline, a second control valve opening or closing said subline when said first control valve opens said subline, means for controlling said first and second control valves to open or close according to the locking condition of the wheel, means for releasing pressurized fluid in the wheel cylinder to outside thereof when said second control valve closes, said controlling means controlling said first control valve to normally close said subline, and to open said subline when locking occurs, and controlling said second control valve to open or close when locking occurs,
said subline system introducing a pressurized fluid to the wheel cylinder according to the locking condition when opening, the flow rate of said pressurized fluid in said subline system being smaller than that of the pressurized fluid introduced by said main line system.

4,630,872

LINEAR SLIDE BEARING

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Filed Jul. 26, 1985, Ser. No. 759,472
Claims priority, application Japan, Sep. 21, 1984, 59-196535
Int. Cl.[4] F16C 29/06
U.S. Cl. 384—45 5 Claims



1. A linear bearing unit comprising:

a pair of bearing case halves disposed in spaced parallel relation with each other and having opposed surfaces facing one another thereby defining a space therebetween, each of the bearing case halves having loaded ball rolling grooves longitudinally formed on their opposed surfaces and ball-recirculating bores longitudinally formed therethrough;

a top plate of less rigidity than said bearing case halves separately formed from the bearing case halves and secured by fastening means to the upper surfaces of the bearing case halves so as to provide an assembled formation of a channellike cross section, the top plate being adapted to be elastically deformable between the bearing case halves;

a track rail disposed in the space defined between the bearing case halves with predetermined clearances formed therebetween, the track rail being provided on the opposite side surfaces thereof with loaded-ball rolling grooves which are disposed in face-to-face relation with corresponding loaded-ball rolling grooves on the bearing case halves so as to form respective loaded-ball rolling regions;

two pairs of end plates which are respectively secured to the opposite longitudinal ends of each of the bearing case halves, each of the end plates being provided, on the inner surface thereof which abuts the corresponding end of one of the bearing case halves, with ball-guide grooves which respectively interconnect each loaded-ball rolling region and the corresponding one of the ball-recirculating bores so as to form respective endless ball-recirculating passages;

a multiplicity of balls disposed in and adapted for recirculating through the endless ball-recirculating passages for bearing a load applied to the bearing unit in the loaded-ball rolling regions formed between the bearing case halves and the track rail; and

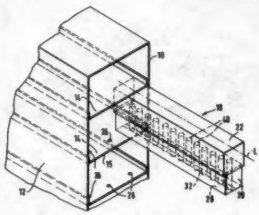
means for causing the top plate to elastically deform for adjusting the clearances between the bearing case halves and the track rail and preloading the balls in the loaded-ball rolling regions.

4,630,873

APPARATUS FOR LOW TEMPERATURE STORAGE OF BIOLOGICAL OR PHARMACEUTICAL SAMPLES

Wolfgang Volker, Tonisvorst, and Klemens Thoma, Krefeld-Huls, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt, Fed. Rep. of Germany

Filed Oct. 24, 1984, Ser. No. 664,318
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 3342489
Int. Cl.[4] F25D 3/10
U.S. Cl. 312—209 10 Claims



1. An apparatus for the low temperature storage of biological or pharmaceutical samples by means of ampoules in a container having cases arranged in the container, wherein the cases are disposed one above the other and have extensible compartments for the storage of the ampoules, the improvement being each of said compartments consisting of a box having means for tightly packing at least two rows of the ampoules in each of said boxes, each of said boxes having a pair of side walls interconnected by a bottom plate, said means for tightly packing said ampoules including at least one row of pins extending upwardly from said bottom plate whereby a row of ampoules may be located on each side of said row of pins with the total number of rows of pins being one less than the number of rows of ampoules, the distance between the vertical axes of each pair of adjacent pins being equal to the distance of the vertical axis of each pin to the nearer of said side walls whereby ampoules having a diameter equal to said distance may be tightly placed between said pins and said side walls, each of said cases including two opposite and parallel side walls, a plurality of spaced flat partitions spanning said side walls of each of said cases, said boxes being stored on said flat partitions, the length of each box being no greater than the length of each of said flat partitions, the distance between adjacent flat partitions being slightly greater than the height of said boxes to minimize storage space, and each partition having a projection nested in a recess in each of said boxes.

4,630,874

ZERO INSERTION FORCE ELECTRICAL INTERCONNECTION ASSEMBLY

Robert M. Renn, Pfafftown, and John R. Shoemaker, Reidsville, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

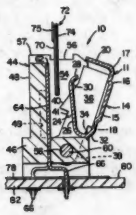
Filed Jun. 20, 1985, Ser. No. 747,088
Int. Cl.[4] H01R 9/07
U.S. Cl. 339—17 F 27 Claims

1. An electrical interconnection assembly for interconnecting conductors in an array to circuitry on the surface of a substrate, the connector comprising:

a housing attachable to the substrate and having a plurality of conductor members each electrically connectable to corresponding circuitry on the substrate;

a unitary spring metal member attachable to the housing and further comprising a formed metal body having a first section and a second section joined by an intermediate bight, the first and second sections being relatively inclined about an acute included angle in a first position, the first and second sections being mutually relatively deflectable about said bight to a second position in which the

relative inclination therebetween is less than in the first position, and a lock depending from the first section for retaining the first and second sections in the second position, energy being stored in the body in the second position, whereby upon positioning the array of conductors



between the second body section and the conductor members in the housing, and deflecting the first section to the second position, the stored energy is transmitted through the second section to the conductor array to maintain a normal force electrical contact between the conductors in the array and the circuitry on the substrate.

4,630,875

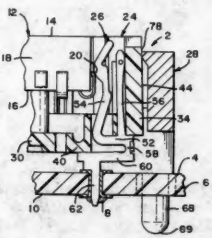
CHIP CARRIER SOCKET WHICH REQUIRES LOW INSERTION FORCE FOR THE CHIP CARRIER

Iosif Korsunsky, Harrisburg, and Dimitry Grabbe, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 627,150, Jul. 2, 1984, abandoned. This application Dec. 18, 1985, Ser. No. 814,511

Int. Cl.[4] H01R *9/09, 13/62, 13/635*

U.S. Cl. 339—17 CF **20 Claims**



17. A chip carrier socket for an integrated circuit chip carrier, the chip carrier comprising a rectangular chip carrier body having oppositely facing major surfaces and outwardly facing chip carrier side surfaces which extend normally of the major surfaces, at least two of the chip carrier side surfaces having spaced-apart contact pads thereon which are between the major surfaces, the socket comprising a socket body having a rectangular recess therein which is dimensioned to receive the chip carrier, contact terminals in the socket body which contact the contact pads when the chip carrier is placed in the recess, the chip carrier socket being characterized in that:

the socket body comprises a rectangular base having peripheral edges and having a chip carrier socket wall extending normally from at least two of the edges which are opposite to each other, each wall extending between two adjacent corners of the base,

the chip carrier socket walls defining the recess for the chip carrier, the walls each having an internal surface which is opposed to a chip carrier side surface when a chip carrier is placed in the recess and having an external surface which faces outwardly, each wall having terminal-receiving cavities extending inwardly thereof from its internal surface, the contact terminals being in the cavities,

the walls being connected to the peripheral edges of the base by integral hinge sections and being stiffly pivotally movable, with the hinge sections serving as pivotal axes, outwardly of the recess,

a cam is provided on the socket body and is movable relative thereto, the cam and the walls having camming means which are effective, upon movement of the cam relative to the body, to pivotally move the walls outwardly of the recess thereby to enlarge the recess and permit placement of the leadless chip carrier in the recess.

4,630,876

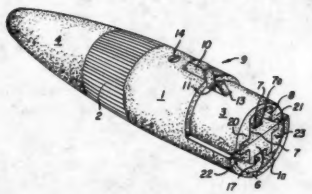
ELECTRICAL CONNECTOR

Robert M. Grunberg, 15 Fairfax Road, Bellevue Hill, N.S.W., 2023, and Michael Dixon, 56 Alt Street, Bondi Junction, N.S.W., 2022, both of Australia

Filed Aug. 2, 1985, Ser. No. 761,851

Int. Cl.[4] H01R *13/639, 13/645*

U.S. Cl. 339—48 **2 Claims**



1. A genderless electrical connector able to matingly co-act with an identical counterpart, said connector including an outer shell having a forward lip and inner wall; an insert portion surrounded by said outer shell and having inserted therein at least a pair of electrical contact strips having matable ends which project into a chamber defined between said outer shell and said insert portion at a counterpart-seeking end thereof; a cable-receiving tail-end portion associated with said outer shell, through which tailend portion an electrical cable may be passed, said contact strips having opposite other ends adapted for connection to the electrical cable; resilient latch means carried by said outer shell and being provided with an outwardly-directed latch hook; and a slot formed in said outer shell, said slot disposed diametrically opposite said resilient latch means and adjacent said lip of said outer shell, said slot being adapted to receive therein the latch hook of a resilient latch means of a said identical counterpart when two of said electrical connectors are pushed longitudinally together into mating relationship so that at least two pairs of said contact strips are pressed together in pairs of like polarity: characterized in that said shell includes at least two splines projecting inwardly from said inner wall, said insert portion spaced inwardly from said outer shell to provide at least two keyways, said projecting splines being so dimensioned as to fit closely into co-acting ones of said keyways formed in the insert portion of a said identical counterpart; said splines and keyways cooperating to prevent inappropriate electrical connection being made, and the said insert portion being removably secured in said outer shell.

4,630,877

SOCKET

Marvin W. Moore, Oxford, Mich., assignor to Microdot Inc., Darien, Conn.

Filed Nov. 15, 1985, Ser. No. 798,434

Int. Cl.[4] H01R *11/00*

U.S. Cl. 339—60 M **5 Claims**

1. A socket for the reception of a bulb comprising:

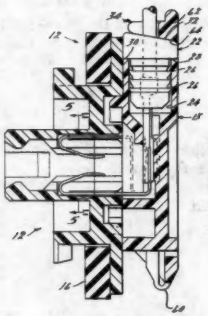
a housing having a terminal strip internally thereof electrically engageable with said bulb,

an elongated grommet receptacle in said housing,

a grommet in said receptacle,

an electrically conductive wire extending 6through said grommet in sealed relation thereto,

a wire terminal on said wire releasably connectable to the terminal strip in said housing,



a foldable latch on said housing engageable with said grommet to bias said grommet into the grommet receptacle in said housing and to maintain said grommet in the receptacle in said housing, and

sealing means on the periphery of said grommet for sealing said grommet relative to the receptacle in said housing.

4,630,878

APPARATUS FOR THE REMOTE-CONTROLLED CONNECTING OR SEPARATING OF TWO COUPLING PARTS

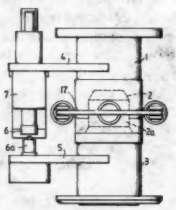
Franz Heine, Dortmund, and Heinz-Joachim Rüttershoff, Schwelm, both of Fed. Rep. of Germany, assignors to O&K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Mar. 26, 1984, Ser. No. 593,594

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311502

Int. Cl.[4] H01R *13/62*

U.S. Cl. 339—75 M 1 Claim



1. An apparatus for remote-controlled coupling or decoupling of upper and lower lockable coupling parts, wherein respectively said two coupling parts are equipped with mechanical form-locking elements and with control-line connectors, one of which parts is operatively provided on a working tool and the other operatively on a carrying device of a hydraulic excavator, said parts being connectable in force-locked manner with each other by a hydraulic-mechanical locking device, said two coupling parts respectively cooperatively define a bore and a pin as the form-locking elements, said upper coupling part provided with an upper lateral holding device and said lower coupling part provided with a lower lateral holding device, the upper coupling part being connected via a rotary drive to said carrying device, and said locking device operatively transverse to the longitudinal axis of the two coupling parts, the improvement comprising:

hydraulic displacement drive means for connecting the control-line connectors separately with each other and respectively for separating said connectors from each other,

a shift element, and wherein at least one of said control-line connectors is mounted on said shift element,

said shift element further comprises a yoke,

guide bolts, wherein said yoke is guided by said guide bolts, and wherein said guide bolts comprise shift displacement members,

guide bushings, wherein each of said guide bolts extends within a respective one of said guide bushings,

said guide bushings are rigidly connected to said holding device of the upper coupling part,

springs,

each respective guide bushing defining an internal seat for cooperation with one end of a respective one of said springs, each said spring being tensioned at its other end against said yoke.

4,630,879

IDC LATCHING TERMINAL

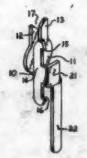
Wilhelmus B. T. van Alst, St. Oedenrode, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 501,107, Jun. 6, 1983, Pat. No. 4,564,254. This application Mar. 11, 1985, Ser. No. 710,125

Claims priority, application United Kingdom, Jun. 10, 1982, 8216938

Int. Cl.[4] H01R *4/24*

U.S. Cl. 339—99 R 7 Claims



1. An electrical terminal comprising an insulation displacement contact at a first end of said terminal and another electrical contact at a second end, a body portion separating the first and second contact ends, a shoulder and support member together forming an L-shaped member extending perpendicularly from the body portion and supporting a pair of latches spaced apart from the body portion and the first contact end,

the latches having mutually facing latch surfaces and being capable of securing two parts of a housing containing the terminal.

4,630,880

TAB REDUNDANT TERMINAL

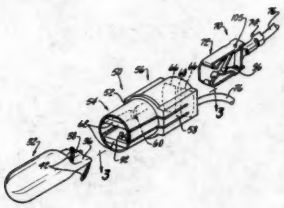
Remie P. Durand, Fraser, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jul. 3, 1985, Ser. No. 752,328
The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.
Int. Cl.[4] H01R *13/514*
U.S. Cl. 339—176 L 3 Claims

1. A snap-in lamp terminal for use in a socket housing for receiving, locating and positioning a wedge-base bulb having a pair of filament extension wires positioned on sides of the wedge base, a pair of troughs extending transverse to the wedge base, the wedge base further having a centrally located cylindrical vent tube and a bulbular evacuated chamber both in the same longitudinal axis, the vent tube bounded by laterally extending side wings of the wedge base, the snap-in terminal comprising:

a lamp receiving portion and a conduit receiving portion;

the conduit receiving portion including wire retention means;



the lamp receiving portion of a generally channelized shape having a terminal base and terminal sides forming the channel;

cantilevered contact arms projecting into the interior of the generally channelized lamp receiving portion from the terminal side via folded tabs;

the contact arms including spring contact members for communication with the detent troughs of the bulb and filament wires of the bulb;

the terminal sides having curved bulb guides at the lamp receiving end to communicate with the wedge-base bulb;

a wire guide means projecting into the interior of the generally channelized lamp receiving portion from one of the terminal sides such that a wiping action will occur when the wedge-base bulb is inserted into the terminal whereby the wire guide means wipes along the vent tube of the bulb thereby straightening any skewed portion of the filament wires; and

redundant terminal means comprising a tab redundant terminal notched out from the contact arm designed for contact with the filament wires;

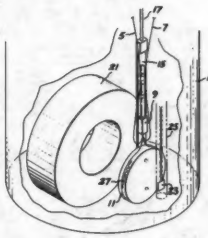
the tab redundant terminal being directed toward the interior of the generally channelized lamp receiving portion of the snap-in terminal toward contact between filament wire and contact arm.

4,630,881

IMMEDIATELY TESTABLE SUPERCONDUCTOR JOINT

Robert C. Kumpitsch, Johnstown; James P. Retersdorf, Gloversville, and Charles W. Lewis, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 4, 1985, Ser. No. 794,994
Int. Cl.[4] H01R *11/01*
U.S. Cl. 339—176 R 4 Claims



1. An immediately testable superconductor joint comprising:

a test loop of superconductor wire;

two superconductor wires to be joined; and

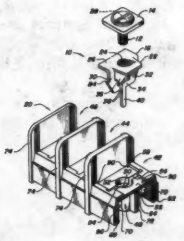
a joint coupling the ends of the test loop and the ends of the two superconductor wires to be joined in a single joint.

4,630,882

LOW PROFILE SCREW TERMINAL BLOCK WITH SPLIT PLASTIC BARREL

Herbert C. Naylor, West Dundee, Ill.; Gregory J. Smith, North Attleboro, Mass., and Howard J. Roeser, Jr., Wheaton, Ill., assignors to Reed Devices, Inc., Carol Stream, Ill.

Filed Jan. 18, 1985, Ser. No. 692,933
Int. Cl.[4] H01R *9/24*
U.S. Cl. 339—198 R 8 Claims



1. A terminal block comprising in combination:

a unitary block having a plurality of screw terminal assembly insert positions, each position including a slotted barrel, said block including at each insert position ribs supporting said barrel, a pair of said ribs including slots which communicate with the slot of said slotted barrel; and

at least one screw terminal assembly including a screw and an insert, said insert including a laterally-running tab with an extruded tube and a vertically-running portion;

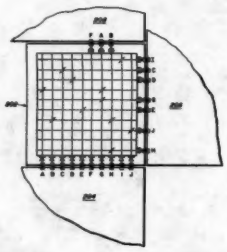
said slotted barrel being adapted to receive the insert portion of said screw assembly and the distal end of said screw, said vertically-running portion of said insert being inserted into said slotted barrel such that said vertically-running portion is held in position in the slot of said slotted barrel.

4,630,883

OPTICAL WAVEGUIDE APPARATUS AND METHOD FOR MANUFACTURING

Henry F. Taylor, Alexandria; George H. Sigel, Great Falls, and Michael E. Gingerich, Woodbridge, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 21, 1983, Ser. No. 480,966
Int. Cl.[4] G02B 6/26
U.S. Cl. 350—96.15 21 Claims



1. An optical waveguide matrix comprising:
a base having
a plurality of sides and
at least one major surface which has
a plurality of intersecting grooves,
said grooves being arranged such that a matrix of intersecting grooves is thereby formed on said base, with at least some of said intersecting grooves extending between different sides of said base,
said matrix having a plurality of nodes where said intersecting grooves cross each other;
a dielectric waveguide material in said grooves such that a matrix of intersecting light waveguides is formed in the base,
said waveguides having ends at the sides of said base,
said waveguides also having cuts made after and not contemporaneous with the manufacture of the base and waveguides at some but not all nodes; each cut forming a slot in the waveguide material that does not extend significantly into the base; and
a plurality of reflecting surfaces formed by said cuts at said nodes,
whereby a light beam traveling in any one of said waveguides may be deflected into at least one intersecting waveguide.

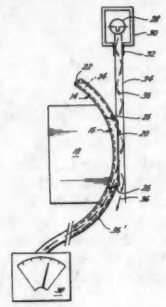
4,630,884

METHOD AND APPARATUS FOR MONITORING OPTICAL FIBER LAPPING AND POLISHING

Paul Jubinski, Houston, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Filed Sep. 4, 1984, Ser. No. 647,226
Int. Cl.[4] G02B 6/26, 6/42
U.S. Cl. 350—96.15 7 Claims

1. An apparatus for monitoring the removal of optical cladding from an optical fiber during the lapping of an optical flat thereon, said optical fiber mounted on a convex surface of a mandrel coupled to a lapping fixture of a lapping and polishing device, comprising:
means for generating a beam of radiation;
means for evanescently coupling said beam of radiation across said optical flat and into said optical fiber; and
means for measuring an intensity level of said radiation evanescently coupled into said optical fiber, and intensity



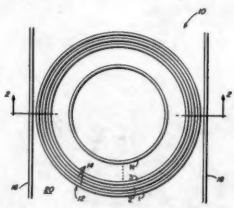
level and function of the amount of optical cladding removed from said optical fiber.

4,630,885

MULTICHANNEL OPTICAL WAVE GUIDE RESONATOR

John R. Haavisto, Scituate, Mass., assignor to Northrop Corporation, Century City, Calif.

Filed Mar. 2, 1984, Ser. No. 585,577
Int. Cl.[4] G02B 6/26
U.S. Cl. 350—96.15 14 Claims



1. Multichannel optical waveguide resonator comprising:
an input dielectric waveguide;
an output dielectric waveguide; and
a plurality of coupled dielectric waveguide rings;
wherein said input and said output dielectric waveguides are coupled to one of said coupled waveguide rings for evanescent wave coupling of light into and out of said one of said waveguide rings; and wherein the perimeters of said waveguide rings and the spacing therebetween are selected for evanescent coupling therebetween so that light in the input waveguide reinforces with light in said one of said waveguide rings.

4,630,886

LIGHTGUIDE DISTRIBUTING UNIT

Philip J. J. Lauriello, Basking Ridge, and Lawrence M. Slavin, Rockaway, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 16, 1984, Ser. No. 600,891
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.20 10 Claims

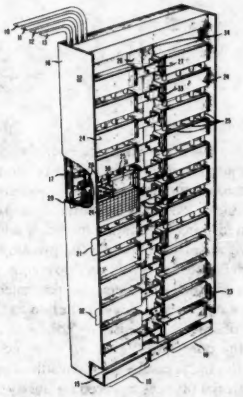
1. A lightguide fiber distributing unit for providing cross-connection facility for relatively fragile lightguide fibers, separated out of at least one otherwise sheathed multifiber cable, by means of relatively robust cross-connection jumper fibers, said unit comprising

at least one shelf portion including spaced upper and lower horizontal plate members in essentially parallel planes with one face of each plate member facing one face of the other, said plate member each having front and rear edges,

means for covering a space between said rear edges of said plate members except for an opening through which said fibers of said cable can be pulled into a region between said plate members,

means for mounting at least one fiber connector means to provide optical coupling via said connector means through said mounting means and between fibers extended to opposite sides of said mounting means,

means for removably securing said mounting means between said front and rear edges of said plate members with a first of said opposite sides facing through said region toward said rear edges and a second of said opposite sides facing toward said front edges so that at least a part of said



mounting means can be temporarily removed to permit access from said front edges for pulling fibers of said cable into said region and connecting such fibers to said connector means on said first side of said mounting means while allowing cross-connect jumper installation on, and removal from, said second side of said mounting means when said mounting means is secured by said securing means,

said removably securing means being spaced back from said front edges of he respective plate members by a distance which is sufficient to assure at least a predetermined minimum fiber bending radius for a jumper fiber extending from a connector on said mounting means second side and out between said front edges of said plate members, but not so far back as to impede significantly installation of cross-connect jumper fibers in connector means on said mounting means.

4,630,887

OPTICAL FIBRE RIBBON STRUCTURE

John E. Taylor, Berkshire, England, assignor to BICC Public Limited Company, London, England

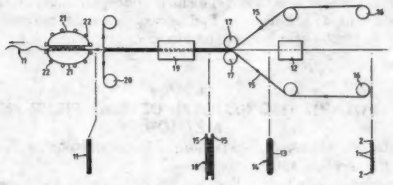
Filed Jun. 14, 1984, Ser. No. 620,426

Claims priority, application United Kingdom, Jun. 17, 1983, 8316493

Int. Cl.[4] G02B 6/44

U.S. Cl. 350—96.23 **15 Claims**

1. An optical fibre ribbon structure comprising a plurality of optical fibres and at least one flexible elongate reinforcing element of substantially resilient material arranged side by side and embedded in an elongate body of plastics material, wherein the resilient reinforcing element is set in such a form that the ribbon structure follows a path of smoothly curved undulations whose axes of curvature lie transverse to the longitudinal axis of the ribbon structure, the arrangement being such that, when the undulating ribbon structure is subjected to a tensile force, the ribbon structure straightens in a lengthwise



direction against the action of the undulating resilient reinforcing element thereby reducing the tensile force applied to the optical fibres and when the tensile force is removed, the ribbon structure returns towards its original undulating form.

4,630,888

MULTIPLE JOINT FOR UNDERWATER OPTICAL FIBER CABLES

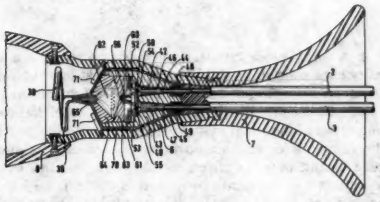
Thierry Dubar, Calais, France, assignor to Les Cables de Lyon, Clinchy Cedex, France

Filed Jun. 15, 1984, Ser. No. 621,310

Claims priority, application France, Jun. 15, 1983, 83 09865

Int. Cl.[4] G02B 6/44

U.S. Cl. 350—96.23 **7 Claims**



1. Multiple joint for underwater optical fiber cables (1, 2, 3) each comprising an optical core of optical fibers (11, 52, 53), a strength member (12) of steel wires, a copper tube swaged onto said strength member and an insulative outer sheath (13), said joint comprising a first cable termination which terminates at least one cable (1), a first storage chamber (22) for storing excess lengths of fiber (11) in said first cable termination, a first connecting member (14) receiving said at least one cable through a bore therein and fastened to the end of said at least one cable (1), a first water tight member (18) closing off said bore within said first connecting member and forming a water tight passage (19) therethrough for passage of the optical fibers (11) of said at least one cable, a first hollow reinforcing member (4) concentrically surrounding said first cable termination, a second cable termination which terminates at least two cables (2, 3) disposed parallel to one another, a common connecting member (40) having parallel bores therein receiving respectively the ends of each of said at least two cables (2, 3) a second watertight member (50) closing off said parallel bores of said common connecting member (40), watertight passages (53, 54) within said second watertight member (50) receiving respective fibers (52, 53) of said at least two cables (2, 3), a second storage chamber (62) for storing excess lengths of fibers (52, 53) projecting from said second watertight member (50), a second hollow reinforcing member (6) concentrically surrounding said second cable termination, an access cable (30) incorporating fibers (11) from said first storage chamber (22) welded to fibers (52,53) from said second storage chamber (62) , a watertight insulative coating (24, 70) protecting the combination of said first and second cable terminations and said

access cable, and a hollow, tubular coupling box (8), and means mechanically linking opposite ends of said coupling box (8) to said first and second reinforcing members (4, 6), said coupling box (8) accommodating said access cable (30), wherein fibers of said at least one cable (1) welded to fibers of said at least two cables (2, 3) are held by said access cable and mechanically protected by said hollow, tubular coupling box.

4,630,889

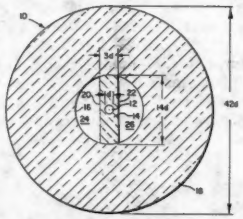
POLARIZATION LOCKED OPTICAL FIBER AND METHOD

John W. Hicks, Jr., Northboro, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 549,875, Nov. 9, 1983, which is a continuation-in-part of Ser. No. 241,861, Mar. 9, 1981, abandoned. This application Apr. 23, 1984, Ser. No. 602,739

Int. Cl.[4] G02B 6/16

U.S. Cl. 350—96.30 21 Claims



1. A single-mode optical waveguide comprising a longitudinally extending hollow tubular member, at least one rigid web transversely bridging the inside of said tubular member and extending longitudinally therealong, a core of light transmitting material mounted in said web and extending longitudinally therealong with at least portions of said web adjoining said core having an index of refraction lower than that of said core to enhance single-mode propagation therein, said waveguide having physical characteristics establishing a stress along the bridging direction of said web for exerting an anisotropic force radially on said core along said web direction to effect a polarization locked characteristic within said waveguide since external forces on said waveguide must be resolved generally along said web direction.

4,630,890

EXPOSED CORE OPTICAL FIBERS, AND METHOD OF MAKING SAME

Arthur Ashkin, and Rogers H. Stolen, both of Rumson, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 22, 1983, Ser. No. 506,594

Int. Cl.[4] G02B 6/16

U.S. Cl. 350—96.30 16 Claims

13. An optical fiber comprising a core having a circumference and at least one cladding layer contactingly surrounding the core, at least a part of the optical fiber being an exposed core optical fiber wherein the cladding layer partially surrounds the core, and wherein in the exposed core part of the optical fiber the cladding layer has a cross section with an outer boundary comprising an arcuate first portion and two second portions, each second portion extending from an endpoint of the arcuate first portion substantially to the core, and wherein the exposed portion of the core extends above the second portions of the outer boundary of the cladding cross section.

4,630,891

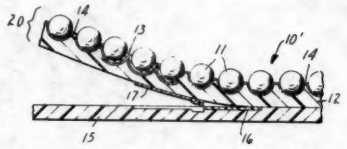
TAMPER RESISTANT SECURITY FILM

Wu S. Li, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 14, 1984, Ser. No. 650,411

Int. Cl.[4] G02B 5/128

U.S. Cl. 350—105 12 Claims



1. A security film comprising a monolayer of transparent microspheres supported in a thin layer of binder material, the binder material comprising an acrylic low-molecular-weight polymer soluble in a nonpolar solvent; a pressure-sensitive adhesive coated onto the binder material; and at least a first patterned layer disposed between the pressure-sensitive adhesive and binder material layers and covering a portion of the interface between the two layers, said patterned layer comprising either (a) a dye having lower adhesion to the binder material than to the pressure-sensitive adhesive such that upon exposure of the complete film to an elevated temperature of 100° C. or more, the pressure-sensitive adhesive separates from the binder material in areas covered by the dye or (b) a nonpolar thermoplastic resin promoting adhesion between the binder material and pressure-sensitive adhesive such that upon exposure of the complete film to an elevated temperature of 100° C. or more, the pressure-sensitive adhesive tends to remain adhered to the binder material in areas covered by the adhesion-promoting resin.

4,630,892

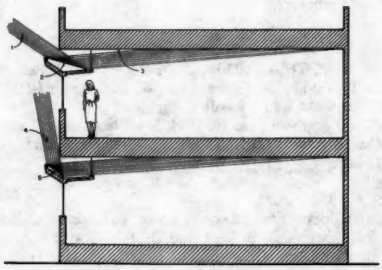
VARIABLE AREA LIGHT REFLECTING ASSEMBLY

Thomas C. Howard, Raleigh, N.C., assignor to Synergetics, Inc., Raleigh, N.C.

Filed Sep. 5, 1985, Ser. No. 772,775

Int. Cl.[4] G02B 17/00

U.S. Cl. 350—264 25 Claims



1. A device for projecting daylight into a structure comprising:

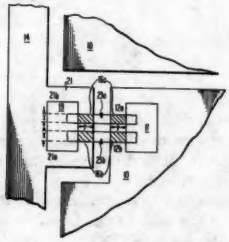
(a) a housing having an exterior aperture and an interior aperture;
(b) a reflective surface comprised of a flexible reflective material inside the housing, said reflective surface having an upper edge and a lower edge;
(c) means for adjusting the angle of the reflective surface with respect to the exterior aperture, such that light entering the exterior aperture may be reflected by the reflective surface through the interior aperture;
(d) means for defining the lower edge of the reflective surface;
(e) means for moving said lower edge defining means;
(f) means for keeping the reflective material substantially taut as the lower edge defining means is moved.

4,630,893

LCD PIXEL INCORPORATING SEGMENTED BACK-TO-BACK DIODE

Thomas L. Credelle, Lawrenceville, and Arthur H. Firester, Skillman, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 29, 1985, Ser. No. 728,660
Int. Cl.[4] G02F 1/13
U.S. Cl. 350—334 **11 Claims**



1. A liquid crystal display pixel comprising:
a substrate;
an address line disposed on said substrate;
an electrode disposed on said substrate adjacent to said address line and having an additional portion;
a free area of said substrate being adjacent to said additional portion;
a first segmented back-to-back diode having a pair of segments respectively disposed on said address line and said additional portion, with the diode area defined by the overlap of one diode segment and said additional portion and the overlap of the remaining diode segment and said address line; and
wherein said free area comprises a hole in said electrode, and said additional portion comprises two segments adjacent said hole, one of the segments of said segmented diode layer being disposed on both of said additional portion segments.

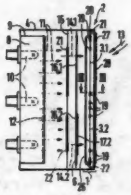
4,630,894

MULTI-COLORED LIQUID CRYSTAL DISPLAY WITH COLOR TRANSFLECTOR AND COLOR FILTER

Rolf A. Cremers, Marxzell, Fed. Rep. of Germany, assignor to Borg Instruments GmbH, Fed. Rep. of Germany

Filed Mar. 20, 1984, Ser. No. 591,533
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310444; Mar. 23, 1983, 3310427
Int. Cl.[4] G02F 1/133
U.S. Cl. 350—338 **8 Claims**

1. A multi-colored liquid crystal display device comprising:
a plurality of offset information areas;
a liquid crystal cell;
an illuminating device extending substantially over the entire display device;
a plurality of colored foils having different colorings, said foils being spaced from and interposed between said liquid crystal cell and said illuminating device in alignment with respective information areas; and
a white or bright metallic transflector arranged intermediate and spaced from said colored foils and said liquid crystal



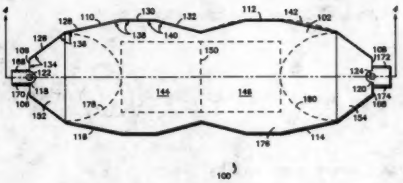
cell, said transflector having different colored areas in alignment with specific colored foils;
whereby light from said illuminating device passes through said colored foils and then through the colored areas of the transflector to said liquid crystal cell to illuminate said information areas and light from the environment passes through said liquid crystal cell and is reflected by the colored areas of said transflector back through said liquid crystal cell to illuminate said information areas.

4,630,895

LCD LIGHTGUIDE

Julio Abdala, Jr., Miami, and Bernard V. Gasparaitis, Tamarac, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 6, 1985, Ser. No. 741,912
Int. Cl.[4] G02F 1/13
U.S. Cl. 350—345 **18 Claims**



1. A display system, comprising in combination:
a liquid crystal display;
a light guide positioned behind said display;
said light guide including a transparent slab of substantially uniform thickness, said slab having a front surface adjacent said display, a rear surface opposing said front surface, and six bordering surfaces substantially perpendicular to said front and rear surfaces, completing the enclosure of said slab;
two of said bordering surfaces being substantially mutually parallel and located at opposite ends of said slab, the remaining four of said bordering surfaces being substantially arcuate in shape;
said rear surface having two planes centrally located and depressed into said rear surface, said planes being substantially rectangular with one edge of each of said planes intersecting said rear surface and the opposite edges mutually terminating at a centerline located substantially equidistant between said parallel bordering surfaces, said centerline being located between said front and rear surfaces;

said arcuate bordering surfaces, said rear surface, and said depressed planes having a means for reflecting light; and a light source located adjacent to each of said parallel bordering surfaces.

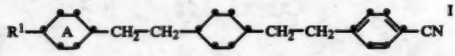
4,630,896

BENZONITRILES

Martin Petrzilka, Kaiseraugst, and Alois Villiger, Basel, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 29, 1984, Ser. No. 614,622
Claims priority, application Switzerland, Jun. 17, 1983, 3334/83
Int. Cl.[4] C09K *3/34*; G02F *1/13*; C07C *121/60, 120/00*
U.S. Cl. 350—350 R 6 Claims

1. A compound of the formula



I

wherein
ring A is 1,4-phenylene or trans-1,4-cyclohexylene, and
R^1 is straight-chain C_1–C_{12}-alkyl or when positioned on a 1,4-phenylene ring R^1 may also be straight chain C_1–C_{12}-alkoxy.

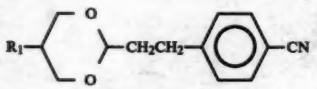
4,630,897

LIQUID CRYSTAL COMPOUNDS

Beatrice M. Andrews, Grimsby; Neil Carr, Hull, both of United Kingdom; George W. Gray, Cottingham, and Christine Hogg, Beverley, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Division of Ser. No. 501,783, Jun. 7, 1983, Pat. No. 4,512,636.
This application Feb. 4, 1985, Ser. No. 697,624
Claims priority, application United Kingdom, Jun. 15, 1982, 8217355
Int. Cl.[4] C09K *3/34*; G02F *1/13*; C07D *319/06*
U.S. Cl. 350—350 R 4 Claims

1. A dioxan compound having the formula:



where R_1 represents an alkyl group.

4,630,898

ETALON OPTICAL LOGIC GATE APPARATUS AND METHOD

Jack L. Jewell, 12 Timberline Dr., Bridgewater, N.J. 08807

Filed Oct. 14, 1983, Ser. No. 542,003
Int. Cl.[4] G02F *1/03, 1/17, 3/00*
U.S. Cl. 350—354 12 Claims

1. A method of operating an optical logic apparatus including a first etalon optical switching device having a nonlinear medium, said method comprising the steps of:

(a) producing a first input beam having a first wavelength and representing a relatively high intensity that represents a first logical state of a first logic signal and guiding said first input beam along an axis that is perpendicular to a surface of said first optical switching device;

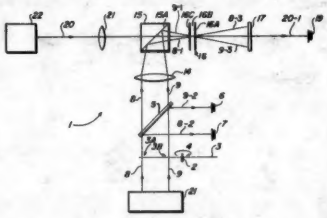
(b) producing a second input beam having said first wavelength and representing a relatively high intensity that represents said first logical state of a second logic signal and guiding said second input beam to said first optical switching device;

(c) producing a first probe beam having a second wavelength and guiding said first probe beam to said first optical switching device while the nonlinear medium is under the influence of said first and second input beams,

wherein the intensity of said first probe beam is much greater than any intensities of said first and second input beams, and wherein said second wavelength is such that said first probe beam does not significantly modify the transmissivity of said nonlinear medium and said first wavelength is such that said first and second input beams do significantly modify the transmissivity of said nonlinear medium;

(d) causing said first optical switching device to produce a first output beam in response to steps (a) through (c), which first output beam has said second wavelength and contains an output signal that is a predetermined logical function of said first and second logic signals, said first output beam having a first intensity level;

(e) changing said first and second input beams to a configuration wherein at least one of said first and second input



beams is at a relatively low intensity representing a second logic level of the first or second logic signal represented by that input beam;

(f) in response to step (e), causing said first output beam to undergo a transition from said first intensity level to a second intensity level that represents a logic state opposite to one represented by said first intensity level; and

(g) guiding said first output beam to a second optical switching device having a nonlinear medium, and producing a second probe beam having said first wavelength and guiding said second probe beam to said second optical switching device, said nonlinear medium of said second optical switching device being such that changing of the intensity of light in said first output beam causes a predetermined change in the transmissivity of said second optical switching device at said first wavelength, causing said second optical switching device to produce a second output beam which has said first wavelength and is a predetermined logical function of said first output beam.

4,630,899

ZOOM LENS HAVING MOVABLE DIAPHRAGM

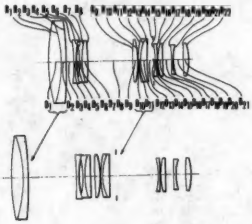
Masatake Kato, Tokyo, and Keiji Ikemori, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1983, Ser. No. 532,577
Claims priority, application Japan, Sep. 18, 1982, 57-162660
Int. Cl.[4] G02B *15/14, 15/15*
U.S. Cl. 350—427 7 Claims

1. A zoom lens comprising:

a varifocal lens system having a plurality of lens components, said lens system including a front component having a positive refractive power and arranged frontmost in the system and a lens component positioned furthest toward the image, wherein positions at which said front lens component and rear lens component lie are more forward in a telephoto setting than at a wide-angle setting; and

a diaphragm on the image side of said rear lens component and movable with zooming so that the position of said



diaphragm in the telephoto setting is further forward in the wide-angle setting.

4,630,900

SYSTEM FOR INTRODUCING BY REFLECTION ADDITIONAL INFORMATION INTO BINOCULARS

Carl Steiner, Dr.-Hans-Frisch-Str. 9, D-8580 Bayreuth, Fed. Rep. of Germany

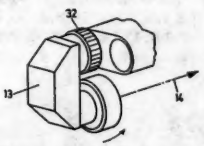
PCT No. PCT/DE84/00079, § 371 Date Dec. 6, 1984, § 102(e) Date Dec. 6, 1984, PCT Pub. No. WO84/04177, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 5, 1984, Ser. No. 686,259

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1983, 8310763[U]; May 9, 1983, 8314105[U]

Int. Cl.⁴ G02B *23/02*

U.S. Cl. 350—539 8 Claims



1. A device for selectively incorporating additional information in the optical path of binoculars in the form of a slide or film strip outside the optical path of the binoculars, the slide or film strip containing a map sector with angle information, said device comprising:

(a) means for illuminating the slide or film strip from behind so as to establish image rays thereof;

(b) means for rotating said slide or film strip so as to rotate the image rays of the additional information;

(c) an arm including a prism arrangement and lens system, said prism arrangement and lens system adapting the path of the image rays of the additional information to the optical path of the binoculars; and

(d) means for pivotably moving said arm between a first position in which the image rays of the additional information are superimposed on the optical path of the binoculars and a second position in which said image rays are removed from said optical path.

4,630,901

BINOCULAR TELESCOPE WITH CENTRAL CONTROL

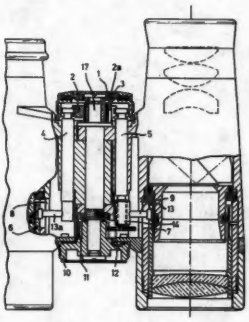
Erwin Altenheiner, Waldsolms-Hasselborn; Günther Schlicht, Solms-Oberbiel, and Joachim Hornschu, Königsbronn, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed Feb. 1, 1985, Ser. No. 697,274

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1984, 8404136[U]

Int. Cl.⁴ G02B *23/00, 7/06*

U.S. Cl. 350—552 7 Claims



1. A binocular telescope comprising, in combination:

(a) two telescope tubes hinged to each other, each of said tubes having an eyepiece near one end thereof and an objective axially movable within the tube near the other end thereof;

(b) a central hinge shaft on which said two tubes swing relative to each other, said shaft having an eyepiece end and an objective end;

(c) each of said tubes having a housing portion which receives said eyepiece and said objective, and a connecting portion which surrounds said hinge shaft;

(d) an adjustment knob (1) for joint focusing of said objectives in both tubes, said adjustment knob being mounted between said tubes near said eyepiece end of said shaft;

(e) a linearly guided drive disk (2) operatively connected by screw threads to said adjustment knob;

(f) two transmission members (4, 5) both operatively connected to said drive disk to be moved thereby and each having a drive part (13, 13*a*) operatively connected to a mount (6, 7) of one of said objectives to cause focusing movement of the respective objective;

(g) a second adjustment knob (10) for moving said objective in only one of said tubes to focus one tube differently than the other tube to compensate for defective vision of a user, said second adjustment knob being mounted between said tubes near said objective end of said shaft;

(h) one of said drive parts (13) being connected to its said transmission member (5) by means of a screw thread so that rotation of said transmission member will cause said drive part to travel axially on said transmission member;

(i) a pinion (12) fixed to said one of said transmission members (5); and

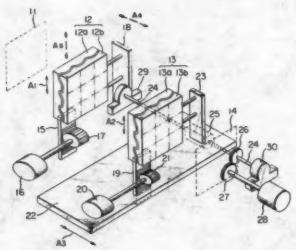
(j) gear teeth (11) turned by said second adjustment knob and meshing with said pinion so that rotation of said second adjustment knob will cause rotation of said transmission member (5) to cause its said drive part (13) to travel axially, thereby to cause focusing movement of its associated objective mount (7) of one tube independently of focusing movement of said objective mount in the other tube.

4,630,902

COMPOUND EYE OPTICAL SYSTEM HAVING A VARIABLE MAGNIFICATION FUNCTION

Noritaka Mochizuki, Yokohama, and Setsuo Minami, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 400,684, Apr. 22, 1982, abandoned. This application May 6, 1985, Ser. No. 731,341
Claims priority, application Japan, Jul. 31, 1981, 56-120455
Int. Cl.[4] G02B *15/04, 15/14, 27/00*
U.S. Cl. 350—570 5 Claims



1. A compound eye optical system having a variable magnification function, comprising:

a first imaging element array component comprising a plurality of imaging elements of the same focal length arranged at an equal pitch;

a second imaging element array component comprising a plurality of imaging elements of the same focal length arranged at a pitch different from that of said first imaging element array component, said second imaging element array component being disposed more adjacent to the image side than said first imaging element array component, a composite optical system consisting of said first imaging element array component and said second imaging element array component forming an image of an object on an image plane; and

means for varying the imaging magnification of the image of the object on the image plane formed by said composite optical system with respect to the same object, said varying means comprising at least three of the following six means all of which three means are varied for each magnification change;

first means for varying the focal lengths of the imaging elements forming said first imaging element array component;

second means for varying the focal lengths of the imaging elements forming said second imaging element array component;

third means for varying the spacing between said first imaging element array component and said second imaging element array component;

fourth means for varying the spacing between said first imaging element array component and the object point;

fifth means for varying the spacing between said second imaging element array component and the image point; and

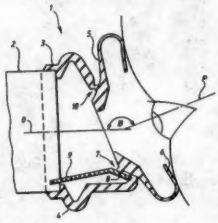
sixth means for varying the value of the ratio of the pitch of the imaging elements of said first imaging element array component to the pitch of the imaging elements of said second imaging element array component.

4,630,903

EYEGUARDS

Richard I. Jones, Clwyd, Wales, assignor to Pilkington P.E. Limited, United Kingdom

Filed Nov. 28, 1984, Ser. No. 675,938
Claims priority, application United Kingdom, Dec. 7, 1983, 8332701
Int. Cl.[4] G02B *23/16*
U.S. Cl. 350—579 12 Claims



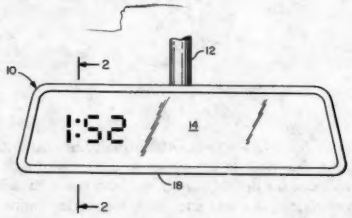
1. An eyeguard comprising a moulded body of deformable material, the body having a front portion adapted to fit onto the viewing end of a device with which the eyeguard is used, a cup portion, and a deformable portion connecting the cup portion to said front portion, said cup portion being urged or biased towards an inclined position at which its axis is inclined relative to the front portion axis, and said deformable portion permitting angular movement of the cup portion relative to said front portion, the eyeguard further having a single closure flap secured to said deformable portion and moveable between a closed position and an open position on angular movement from said inclined position of said cup portion relative to said front portion.

4,630,904

COMBINATION REAR VIEW MIRROR AND DIGITAL DISPLAYS

Ronald Pastore, 149 Heathcote Rd., Lindenhurst, N.Y. 11757

Filed Jan. 22, 1985, Ser. No. 693,368
Int. Cl.[4] G02B *5/08, 7/18*
U.S. Cl. 350—600 4 Claims



1. An improved rear view mirror of the type used in motorized vehicles comprising a two-way mirror consisting of a plate of tinted glass and housing means mounted flush against one side of said glass plate, both supported by a mounting column, means consisting of a light emitting diode clock mounted along the perimeter of said glass plate joining said housing to said plate and preventing light from entering between said housing and plate, and recesses formed in said housing up against said plate wherein means are mounted flush with said glass plate for producing a light to display information, whereby in the absence of said light the full surface of said glass plate is available as a rear view mirror.

4,630,905

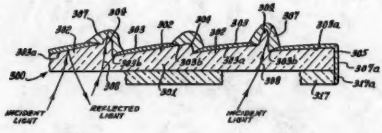
ELIMINATION OF INTERNAL REFLECTIONS AND DIFFRACTIONS FROM JUNCTURES IN, AND AT THE PERIPHERY OF, A SEGMENTED MIRROR

C. James Blom, Bakersfield, Calif., assignor to Roxor Corporation, Bakersfield, Calif.

Division of Ser. No. 642,179, Aug. 20, 1984, and a continuation-in-part of Ser. No. 385,544, Jun. 7, 1982, Pat. No. 4,470,665, which is a division of Ser. No. 233,106, Feb. 10, 1981, Pat. No. 4,368,951. This application Nov. 18, 1985, Ser. No. 799,248

Int. Cl.[4] G02B 5/08, 1/10, 7/18

U.S. Cl. 350—613 7 Claims



1. In a molded segmented mirror having individual sectors and comprising a myriad of reflecting surfaces on the front side of a molding closest to the viewer, said surfaces oriented to produce, in the eyes of the viewer, one virtual image, or separate virtual images from separate portions of such molded mirror, there being a network of zones separating the individual mirror sectors, and the sectors being metallized, the improvement comprising:

(a) the metalizing material being applied to the sectors and not to the intervening zones,

(b) the thickness of metalizing material being feathered to a partial mono-molecular thickness around the periphery of each sector.

4,630,906

BLANK FOR EYEGLASS LENSES HAVING ELLIPSE-LIKE EDGE CURVES AND MEANS AND METHOD FOR SELECTING

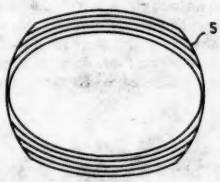
Hubert Bammert, Aalen; Hans Lahres, AA-Wasseralfingen, and Egon Mosch, Essingen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed May 11, 1983, Ser. No. 493,729

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 32181396

Int. Cl.[4] G02C 7/02

U.S. Cl. 351—159 10 Claims



1. A series of eyeglass blanks forming a collection from which one may select a blank suitable for making by normal finishing methods and without grinding a new surface on the blank, a finished eyeglass lens in accordance with a prescription which calls for a lens which

(a) has a center thickness greater than its edge thickness in at least one cross section, and

(b) has different optical powers in different cross sections, and

(c) has dioptric powers within a substantial range of powers for which the series is designed,

each blank in said series having an ellipse-like edge curve on at least partial regions of its periphery, said ellipse-like edge curve being so placed with respect to dioptric curvatures of said blank that the edge thickness of the finished eyeglass lens made from the blank varies by less than 1.5 mm throughout said ellispe-like edge curve, and the weight of the finished lens is substantially less than the weight of a lens of the same dioptric power made from a conventional circular blank.

4,630,907

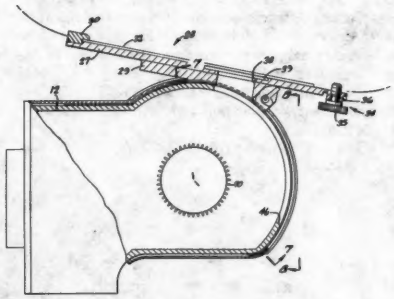
APPARATUS FOR PIVOTALLY MOUNTING A FILM MAGAZINE TO A MOTION PICTURE CAMERA

Albert L. Mayer, Tarzana, Calif., assignor to Panavision, Inc., Tarzana, Calif.

Filed Jan. 8, 1986, Ser. No. 817,001

Int. Cl.[4] G03B 23/02

U.S. Cl. 352—75 16 Claims



1. An apparatus for mounting a motion picture film magazine to a motion picture camera body, the apparatus comprising, a mounting bracket, said mounting bracket having an aperture therethrough, means to attach a first side of said mounting bracket to the film magazine, an adjustment aperture formed in the motion picture camera body, flexible light shield means having an aperture therethrough and being connected to a second side of said mounting bracket, said flexible light shield means being arranged so as to be slidable within said adjustment aperture and being further arranged such that said aperture in said flexible light shield means is aligned substantially with said aperture in said mounting bracket, and means to releaseably lock said mounting bracket in a selected position.

4,630,908

AUDIO-VISUAL TUNNEL WITH ENDLESS CONVEYOR

Daniel Tremblay, 1429 Dupuis Street, Macouche, Canada (J7K 2V2)

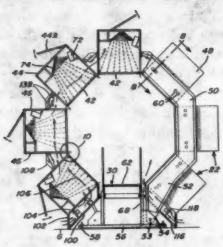
Filed May 20, 1985, Ser. No. 735,986

Int. Cl.[4] G03B 21/10

U.S. Cl. 353—94 13 Claims

1. An apparatus for entertaining a number of persons, comprising an elongated tunnel including an endless conveyor constituting the floor of the tunnel, a plate supporting said conveyor, a number of spaced-parallel arch-shaped frames upstanding from said base plate and tunnel floor transversely to said conveyor, a number of image projecting boxes removaly supported by said arch-shaped frames each having an inner wall constituting a projection screen, the projection screens of

the several boxes defining the inner wall of said tunnel, and means in said boxes producing images on said screens that are



visible from within said tunnel, said conveyor capable of transporting said persons from one end to the other of said tunnel.

4,630,909

APPARATUS FOR MEASURING THE POSITION OF A LIGHT SOURCE DISPOSED INSIDE A LIGHTHOUSE

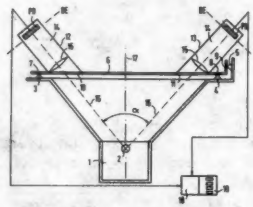
Dieter Forker, Altbach; Joachim Hassler, Esslingen; Bernhard Lau, Aichwald, and Rolf Schmidt, Esslingen, all of Fed. Rep. of Germany, assignors to Standard Elektrik Lorenz AG, Stuttgart, Fed. Rep. of Germany

Filed Feb. 14, 1985, Ser. No. 701,415

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405306

Int. Cl.[4] G03B *41/00, 11/26*

U.S. Cl. 354—1 **6 Claims**



1. Apparatus for measuring a position of an elongated light source in a lighthouse used in the manufacture of luminescent screens of color picture tubes, comprising:

a base plate capable of being placed onto the lighthouse in place of a face-plate and aperture-mask unit;

first and second optical projection devices carried on said base plate, each projecting an image of said light source on first and second imaging planes, respectively;

at least two first position diodes disposed in said first imaging plane;

at least two second position diodes disposed in said second imaging plane; and

an evaluating circuit coupled to said first and second position diodes.

4,630,910

METHOD OF MEASURING IN THREE-DIMENSIONS AT HIGH SPEED

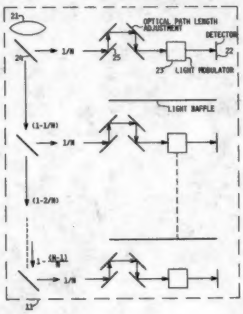
Joseph Ross, Ft. Salonga, and Paul DiMatteo, Huntington, both of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed Feb. 16, 1984, Ser. No. 580,653

Int. Cl.[4] G03B *29/00*

U.S. Cl. 354—76 **8 Claims**

1. An arrangement for recording a scene with a common aperture and multiple cameras comprising: a lens for imaging the scene on N light-sensitive surfaces; N beam splitters for dividing light from said lens into N equal intensity paths; N shutters operated by a controller, one controller being in each said path; N said light-sensitive surfaces following each said



shutter; and means for independently adjusting the path length to each said light-sensitive surface; each shutter blocking incident light of its path until commanded by said controller to pass said light for the duration of a coded pattern projected during said duration.

4,630,911

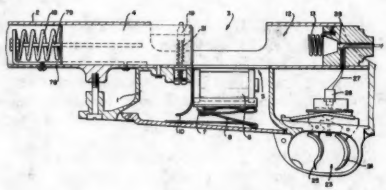
CAMERA GUN

Larry W. Paul, 28950 Bonita Vista Rd., Mountain Center, Calif. 92361

Filed Sep. 21, 1984, Ser. No. 653,025

Int. Cl.[4] G03B *17/00, 29/00, 3/00*

U.S. Cl. 354—82 **46 Claims**



1. An assembly for mounting a camera and having the appearance of a firearm comprising: means for supporting a camera including a stock and a barrel mounted on the stock; a chamber portion in the barrel; a bolt which is slidably mounted within the chamber; and film storage means communicating with the chamber so that a film cartridge can be stored in the film storage means and removed from the chamber when the bolt is open.

4,630,912

WET PROCESSING WEB CAMERA AND METHOD

George D. Whiteside, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 24, 1985, Ser. No. 747,899

Int. Cl.[4] G03B *17/50*

U.S. Cl. 354—88 **14 Claims**

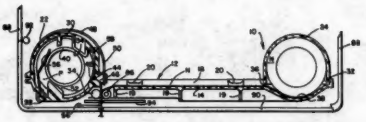
1. Photographic apparatus for a film system having a pair of sheet elements, one of which includes a processing agent and the other of which includes a photographic negative, said apparatus comprising:

a cassette having means for defining spaced first and second discrete storage chambers for the processing and negative elements of said film system, respectively, both said stor-

age chambers having openings for the passage of the respective elements therefrom;

means situated between said storage chambers to present the negative element for exposure;

means for withdrawing the film elements from said storage chambers and for bringing said processing and negative elements into face-to-face contact after exposure of the negative element;



movable means for sealing the opening of the one of said storage chambers containing the processing element; and

means for withdrawing said movable means from the opening of said one storage chamber during passage of the element carrying the processing agent from said one storage chamber.

4,630,913

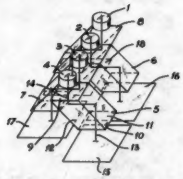
EXTENDED DEPTH-OF-FIELD 3-D CAMERA

Allen K. W. Lo, 5022 Hidden Branches Dr., Dunwoody, Ga. 30338

Filed Dec. 16, 1985, Ser. No. 809,598

Int. Cl.⁴ G03B *35/10*

U.S. Cl. 354—115 **7 Claims**



1. In a three dimensional camera for taking three dimensional pictures:

(a) a plurality of lenses with a negative holder for each lens, with each negative holder being optically offset from the axis of the respective lens, with alternate negative holders being offset from each other;

(b) at least one reflective element placed between each lens and its respective negative holder, with each element having at least one reflective surface arranged in a position so that each reflective surface is at an angle of approximately 45° to the image transmitted from the lens so that the images transmitted through each lens are reflected by the reflective elements onto the respective negative holders.

4,630,914

PHOTOGRAPHIC FILM FRAME EJECTOR

Frank M. Czumak, Salem, N.H., and Donald J. Sulesky, Arlington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

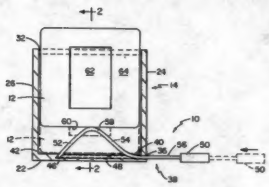
Filed Dec. 16, 1985, Ser. No. 809,031

Int. Cl.⁴ G03B *17/26*

U.S. Cl. 354—212 **9 Claims**

1. Apparatus for sequentially moving a plurality of individual film frames from a container of the type having an ingress, an egress, and a restraining structure for restricting movement of a film frame ejector to a single plane, said apparatus comprising:

a film frame ejector having a film frame engaging portion which is adapted to extend into the container via the ingress, said film frame ejector being adapted to be moved from a first configuration wherein said film frame ejector is located at least in part within the restraining structure of the container and is in a relatively unstressed condition with said film frame engaging portion located adjacent an edge of a film frame, and a second configuration wherein said film frame ejector is in a stressed condition, said film



frame engaging portion being moved in a first direction so as to move a film frame at least partially through the container's egress as said film frame ejector is moved from said first configuration to said second configuration; and

means for applying a force in a second direction substantially normal to said first direction for moving said film frame ejector from said first configuration to said second configuration.

4,630,915

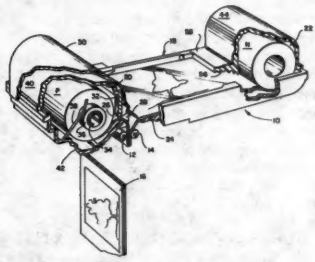
MULTIPART CASSETTE FOR TWO COMPONENT FILM SYSTEM

George D. Whiteside, Lexington, and Robert E. Cavallaro, Norwood, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 24, 1985, Ser. No. 747,901

Int. Cl.⁴ G03B *17/26, 17/50*

U.S. Cl. 354—275 **10 Claims**



1. A cassette for a photographic film system, the cassette having photosensitive and processing film elements adapted for processing after exposure of the photosensitive element by face-to-face contact of both elements with each other, said cassette comprising:

a first housing having at least two parts for defining a light-tight photosensitve film chamber when loaded with a photosensitive film element;

a second housing having at least two parts for defining a processing film chamber when loaded with a processing element;

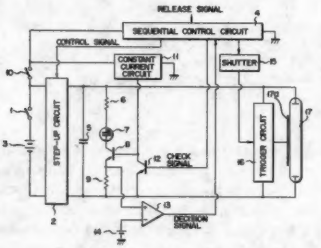
said first housing having a longitudinal opening for passage of said phtosensitve film element therefrom toward said second housing; and

said second housing having an opening for passage of said processing film element toward said second housing and into face-to-face contact with portions of said photosensitive film element extending from said first housing.

4,630,916
CIRCUIT FOR DETECTING CHARGED VOLTAGE OF ELECTRONIC FLASH

Minoru Ishiguro, Urawa; Kouji Kaneko, Oomiya, and Toru Kondo, Yokohama, all of Japan, assignors to Fuji Photo Optical Co., Ltd., Oomiya and Kabushiki Kaisha Toshiba, Kawasaki, both of, Japan

Filed Sep. 5, 1984, Ser. No. 647,400
Claims priority, application Japan, Sep. 12, 1983, 58-166760
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—418 **3 Claims**



1. A circuit for detecting charged voltage of electronic flash comprising:

means for stepping up a voltage of a battery;

means for storing charges under a high voltage from said step-up means;

means for flashing in response to a trigger signal applied, with a charged voltage across said storing means applied between electrodes of said flashing means;

voltage dividing means having a switching means inserted therein in a series fashion, said voltaging dividing means providing a voltage corresponding to the charged voltage across said storing means;

means for comparing a voltage from said voltage dividing means with a reference voltage; and

a sequence control circuit, operating such that said sequence control circuit operates in response to a release signal produced when a release button is operated, applies a check signal to said switching means in said voltage dividing circuit, thereby to render said switching means conductive, and fetches the result of the comparison from said comparing means to check whether a recharge to said storing means is needed or not.

4,630,917
EXPOSURE CONTROL DEVICE OF A CAMERA

Osamu Maida, Tokyo, and Takashi Saegusa, Kawasaki, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Sep. 13, 1984, Ser. No. 650,226
Claims priority, application Japan, Sep. 20, 1983, 58-173666
Int. Cl.[4] G03B *7/08*
U.S. Cl. 354—456 **29 Claims**

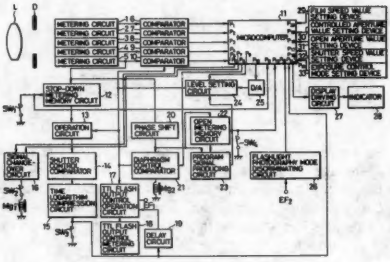
1. A camera in which setting means for setting plural exposure factors is provided and a stop and a shutter are driven in response to a release operation in accordance with said plural exposure factors which are set, comprising:

(a) metering means which meters the light of a subject to be photographed through the stop and generates a metering signal, the metering signal being an analog signal;

(b) first control means which produces a first control signal prior to said release operation and which produces a second control signal in response to said release operation in accordance with at least one of said plural exposure factors which are set, the first and second control signals each being a digital signal;

(c) means for making a first reference signal in accordance with said first control signal and a second reference signal in accordance with said second control signal, the first and second reference signals each being an analog signal;

(d) means for comparing said first reference signal with said metering signal, the comparing means producing a comparison signal when said first reference signal and said metering signal reach a predetermined relation and said first control means operating, prior to said release operation, to obtain a proper exposure in accordance with said comparison signal and said plural exposure factors to generate an operation output;



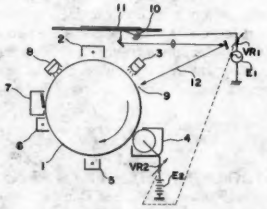
(e) means for indicating in accordance with said operation output; and

(f) second control means for controlling said shutter in response to said release operation in accordance with said metering signal and said second reference signal.

4,630,918
IMAGE COMPENSATING METHOD IN A COPYING MACHINE

Yuhi Yui, Nara, and Hiroshi Kinashi, Uji, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 11, 1985, Ser. No. 743,650
Claims priority, application Japan, Jun. 11, 1984, 59-121009
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R **8 Claims**



1. An image compensating method in a copying machine comprising the steps of:

applying a bias voltage to a developer unit of the copying machine;

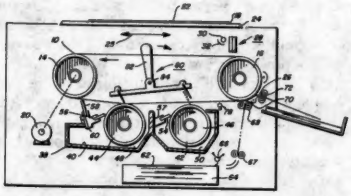
controlling the intesity of light to be projected at an exposure section of the copying machine; and

simultaneously adjusting both said bias voltage to be applied to the developer unit and the intensity of light to be projected at said exposure section onto a photosensitive medium.

4,630,919
SELECTABLE COLOR SYSTEM

Joseph Fantuzzo, Webster, and Edwin R. Monkelbaan, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 22, 1985, Ser. No. 757,552
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—4 6 Claims

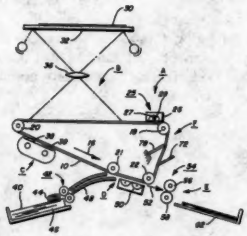


1. Printing apparatus comprising a flexible photoreceptor belt movable past a series of image processing stations, said belt being driven around at least two support rollers, means to form an electrostatic latent image on said belt, means to develop said electrostatic latent image with a marking material comprising a developer module having at least two alternately selectable stationary developer housings positioned within a run of the photoreceptor belt between said support rolls, means to alternately urge said photoreceptor belt into development engagement with one of said stationary developer housings to develop said electrostatic latent image said urging means comprising a dual position articulating backup blade in the interior of the run of said belt, the two ends of which are alternately engageable with the belt to provide developing engagement with one of said developer housings, and means to transfer said developed image to a receiving surface.

4,630,920
BLADE CLEANING APPARATUS FOR REMOVING RESIDUAL TONER FROM A CHARGE RETENTIVE SURFACE

Mort Silverberg, Rochester; Richard G. Maus, Macedon, and Nero R. Lindblad, Ontario, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 6, 1985, Ser. No. 773,288
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—15 47 Claims



1. Blade cleaning apparatus for removing residual toner particles from a flexible charge retentive member supported for movement in an endless path, said apparatus comprising:

a cleaning blade supported for contact with the imaging side of said charge retentive member;

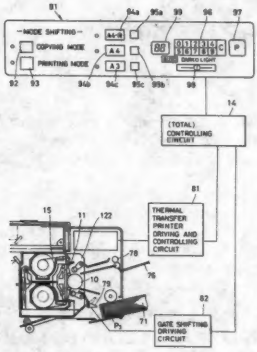
means for effecting pressure engagement between said blade and belt whereby said belt is deflected; and

a backing member supported in contact with the opposite side of said charge retentive member from said imaging side for controlling the deflection of said flexible belt whereby the force required for efficient cleaning by the cleaning blade is minimized and there is substantially uniform contact between the blade and the charge retentive member.

4,630,921
COMBINED PRINTER-COPIER APPARATUS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Dec. 18, 1984, Ser. No. 682,921
Claims priority, application Japan, Dec. 21, 1983, 58-241382
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 SH 9 Claims



1. An apparatus for transferring an image onto sheet-shaped material, comprising:

a housing;

storage means, attached to said housing, for storing a plurality of sheets of said sheet-shaped material;

an original holding surface on which an original is placed;

a discharging tray connected to said housing;

copying means, mounted within said housing, for copying an image of the original placed on said original holding surface onto said sheets, said copying means including a photosensitive body, means for forming a latent image corresponding to said image of said original on said photosensitive body, means for developing said latent image, and means for transferring said developed latent image to said sheets;

printing means, mounted within said housing, for printing an information-based image onto said sheets in response to image information, said printing means including at least one coloring agent and means for transferring said coloring agent onto said sheets to form said information-based image on said sheets;

feeding means for selectively feeding said sheets from said storage means to either said copying means or said printing means;

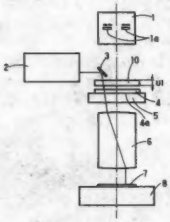
conveying means for selectively conveying a sheet onto which said information-based image has been printed by said printing means either to said original holding surface or to said discharging tray; and

control means for controlling said copying means, printing means, feeding means, and conveying means so as to perform a printing-copying operation in which copying is carried out by said copying means using as said original a sheet having an information-based image formed in said printing means and being conveyed to said original holding surface by said conveying means.

4,630,922
PATTERN TRANSFER APPARATUS

Shunzo Imai, Yamato, and Ichiro Ishiyama, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1985, Ser. No. 707,235
Claims priority, application Japan, Mar. 6, 1984, 59-41326
Int. Cl.[4] G03B 27/52
U.S. Cl. 355—55 23 Claims



1. An apparatus for transferring a pattern of a first object onto a second object, comprising:

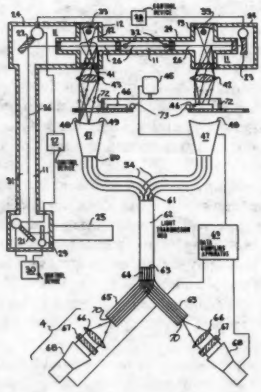
optical means for relating the first and second objects to each other with a beam; and

correcting means for optically correcting any change in the optical path length between said optical means and the pattern of the first object due to any change in the thickness of the first object, said correcting means including a flat plate-like member.

4,630,923
FIBEROPTIC SPECTROPHOTOMETER

Petrus P. Tans, and Daniel A. Lashof, both of Berkeley, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 4, 1985, Ser. No. 697,824
Int. Cl.[4] G01J 3/44; G01N 21/65
U.S. Cl. 356—301 16 Claims



1. A method for analyzing the relative composition of two similar gases, including the steps of:

passing an intense laser beam through samples of each of the two gases, the composition of one of which is accurately known, for producing a band of Raman-scattered light from each;

alternately directing each of the bands of Raman-scattered light from each gas through a common light-mixing system so that all wavelengths present in the Raman-scattered light from each sample will be mixed spatially in a thorough manner;

directing the mixed Raman-scattered light to light detection systems each of which is tuned to measure a particular wavelength of light representing the presence of and relative amount of a constituent element of the gas sample;

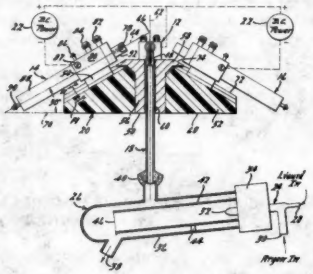
comparing a ratio of constituent elements present in the known gas sample to that of the unknown gas sample; and

determining the relative amounts of each constituent element of the unknow gas by comparing the relationship of an amount of Raman-scattered light from a constituent in the unknown gas sample to the amount of Raman-scattered light from the other constituents in the unknown gas sample with the relationship of an amount of Raman-scattered light from a constituent in the known gas sample to the amount of Raman-scattered light from the other constituents in the known gas sample.

4,630,924
CONICAL DC PLASMA EMISSION SOURCE

Gerhard A. Meyer, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 29, 1985, Ser. No. 760,182
Int. Cl.[4] G01N 21/73
U.S. Cl. 356—316 19 Claims



1. A spectrochemical emission source, comprising:

at least three sources of an ionized gas plasma stream, each of said sources receiving D.C. electrical power such that one of said sources has the opposite polarity of the other of said sources;

means for supporting and aligning said sources such that the combination of said ionized gas plasma streams form a plasma body having a generally conical shape at one end of said plasma; and

means for injecting a sample stream into said plasma body such that said sample stream is captured by said conical shape of said plasma body and transmitted into said plasma body.

4,630,925
COMPACT TEMPORAL SPECTRAL PHOTOMETER

Norman H. Schiller, Whitestone, and Robert R. Alfano, Bronx, both of N.Y., assignors to Hamamatsu Corp., Middlesex, N.J.

Filed Nov. 1, 1982, Ser. No. 437,897
Int. Cl.[4] G01J 3/30
U.S. Cl. 356—318 25 Claims

1. A temporal spectral photometer for use in obtaining spectral and temporal information simultaneously of an ultrafast pulse of light comprising:

a. a housing having a pin hole type entrance slit for admitting at least a portion of said light,

b. a streak camera tube disposed inside said housing, said

streak camera tube having a photocathode on front thereof and a phosphor screen on the back thereof,

c. electronic circuit means for driving said streak camera tube,

d. optical means disposed inside said housing between said pin hole slit and said streak camera tube for forming an

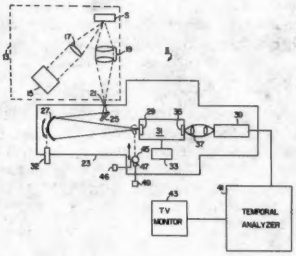


image of the pin hole slit onto the photocathode of the streak camera tube and at the same time dispersing the light admitted through said pin hole slit into its component wavelengths, and

e. means for recording the resulting output image formed on the phosphor screen.

4,630,926

FINE CLEARANCE MEASURING APPARATUS

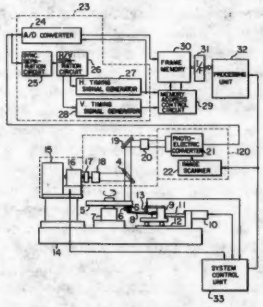
Katsuyuki Tanaka; Seiichiroo Terashima; Yoshinori Takeuchi; Toshiko Odaka, all of Ibaraki, and Yokuo Saito, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 23, 1984, Ser. No. 633,274

Claims priority, application Japan, Dec. 21, 1983, 58-239732

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—357 **10 Claims**



1. An apparatus for measuring a clearance between two articles, at least one of said two articles having a transparent portion, comprising:

optical means for applying light of variable wavelength to said clearance through said transparent portion in said one article;

means for focusing a reflection light including information of an interference fringe pattern from a surface plane of said clearance;

photo-electric conversion means for photo-electrically converting a light intensity distribution on the focusing plane of said reflection light to form a photo-electrically converted plane corresponding to said focusing plane;

means for scanning an interference fringe pattern on said photo-electrically converted plane formed by said photo-electric conversion means to produce an electrical signal representing the interference fringe pattern;

means connected to said optical means, for altering the wavelength of said variable-wavelength light, so as to enable said scanning means to produce electrical signals representing respective interference fringe patterns produced by different wavelengths; and

processing means for detecting positions of the interference fringe patterns based on said electrical signals to determine the order of a peak point of either one of said interference fringe patterns on the basis of a difference in positions of the interference fringe patterns, to thereby calculate a value of the clearance between said two articles.

4,630,927

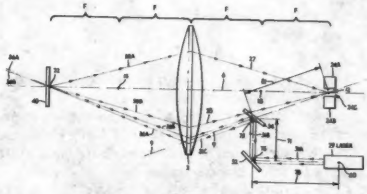
OPTICAL PROJECTOR

Emmet M. Fulkerson, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Feb. 15, 1983, Ser. No. 466,741

Int. Cl.[4] G01B *11/14*

U.S. Cl. 356—372 **6 Claims**



1. An optical projector, comprising:

(a) a laser, which is subject to pointing instability, for projecting a light beam along a first path, the light beam appearing as a virtual point source;

(b) a lens having a center, a first and a second side, and an optical axis for

(i) receiving the light beam on a first side and off-center,

(ii) focusing the light beam toward an object located on a second side of the lens,

(iii) receiving light reflected by the object, and

(iv) focusing the light received in (iii) to a point on the first side of the lens;

(c) a photosensor positioned near the point of (b)(iv) for

(i) receiving the focused light of (b)(iv) and

(ii) producing a predetermined signal when the reflection of (b)(iii) occurs at a predetermined point; and

(d) means interposed in the first path of (a) for

(i) receiving the light beam of (a),

(ii) transmitting the light beam toward the lens along a second path which is nonparallel to the optical axis, and

(iii) imparting to the light beam characteristics of a light beam projected from the virtual point source positioned in the photosensor, for reducing the effects of the pointing instability.

4,630,928

LENGTH MEASURING DEVICE

Otto Klingler, Oberndorf-Boll, and Siegfried Grühler, Vöhringen, both of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Filed Mar. 21, 1985, Ser. No. 714,695

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1984, 3412557

Int. Cl.[4] G01B *7/02*

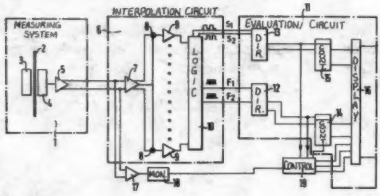
U.S. Cl. 356—374 **4 Claims**

1. A device for measuring the length of a movement comprising:

measuring means for generating two mutually offset sinusoidal voltage signals which depend on the movement whose length is to be measured;

interpolation means connected to said measuring means for receiving said voltage signals and for generating therefrom two high resolution rectangular pulse sequences which are offset from each other by 90° and which correspond to an interpolation between said two voltage signals, said interpolation means also generating two low resolution rectangular pulse sequences which are offset with respect to each other by 90° and which correspond to the two voltage signals;

evaluation means connected to said interpolation means for receiving said high and low-resolution pulse sequences



and for evaluating a length measurement based on at least one of said pulse sequences;

monitor means connected to said measuring means for receiving said voltage signals and for generating a speed related signal which corresponds to a speed of the movement to be measured; and

control logic means connected to said monitor means for receiving said speed related signal and being connected to said evaluation means for blocking the use of said high resolution pulse sequences when said speed related signal indicates a speed above a selected value, and for including said high resolution pulse sequences and said low resolution pulse sequences for evaluation of the length when said speed relates signal indicates a speed below said value.

4,630,929

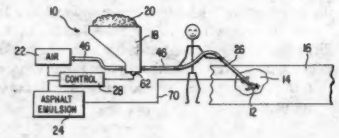
APPARATUS FOR PRODUCING PATCHING MATERIAL FOR FILLING POTHOLES IN PAVED SURFACES

Michael A. Medlin, 125 Conestoga Rd., Madison, Miss. 39110

Continuation-in-part of Ser. No. 659,133, May 9, 1984, abandoned. This application Aug. 29, 1985, Ser. No. 770,617

Int. Cl.[4] B28C *5/06*

U.S. Cl. 366—10 **6 Claims**



1. An apparatus for producing patching material for filling potholes in paved surfaces comprising:

(a) a hopper means for holding a quantity of pulverulent material, said means having an opening for receiving said marterial from a source and a transport tube means in the bottom of said hopper means, said tube means having an inlet opening connected to a source of air under pressure and an outlet opening connected to a discharge nozzle, said transport tube means also having an intake opening intermediate said inlet and outlet openings to receive said material into said transport tube means, and means adjacent said intake opening to cause said material to be drawn into said tube by said air flowing under pressure in through said intake opening and out through said outlet opening;

(b) means between said outlet opening and said discharge nozzle to dissipate part of the air stream so that said material will not be blown out of said pothole during filling; and

(c) means adjacent said discharge nozzle for introducing an emulsion to combine with said material prior to its discharge from said nozzle into said pothole.

4,630,930

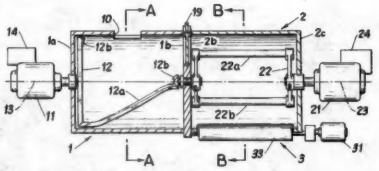
HIGH SPEED BATCH MIXER

Samuel O. Selling, Richmond, Va., assignor to AMF Union Machinery Inc., Richmond, Va.

Filed Sep. 4, 1984, Ser. No. 646,410

Int. Cl.[4] B28C *7/16*; A21C *1/00*

U.S. Cl. 366—77 **10 Claims**



1. A semi-continuous batch mixing apparatus for mixing and developing bakery dough comprising:

a cylindrical blending chamber for mixing a batch of bakery dough ingredients, said blending chamber having a substantially horizontal central longitudinal axis;

a helical agitator mounted for rotation about the central longitudinal axis of said blending chamber,

said helical agitator having a plurality of blades for rotation adjacent to the circumference of the interior of said blending chamber, each said blade having an angled slope with respect to the horizontal at substantially each point along said blade and having a cross section with a flat side moving adjacent to said blending chamber's circumferential wall such that upon rotation of said blades the batch ingredients are mixed by driving the ingredients towards one lateral end of said blending chamber;

means for rotating said helical agitator;

inlet means into said blending chamber for introduction of a batch of dough ingredients from the top of said blending chamber, said inlet means being sealed when closed to prevent leakage of the batch ingredients during agitation:

a selectively closable outlet hatchway located at the lateral end of said blending chamber in the direction of movement of the batch ingredients, said hatchway being located above the central longitudinal axis of said blending chamber, and being sealed when closed such that leakage is prevented from said blending chamber during agitation and upon opening said hatchway the batch ingredients are moved through the opening by the rotation of said helical agitator and out of said blending chamber;

a cylindrical developing chamber for developing the mixed batch of ingredients into a proper consistency mounted horizontally adjacent to said hatchway on said blending chamber for receiving the mixed batch of ingredients, said developing chamber having a substantially horizontal central longitudinal axis;

a developing agitator mounted for rotation within said developing chamber about an axis substantially in line with the central longitudina axis of said blending chamber,

said developing agitator having a plurality of bars mounted

for rotation concentrically about the axis of said developing agitator;

means for rotating said developing agitator;

two exhaust rollers mounted adjacent to each other on the periphery of said developing chamber below the central longitudinal axis of said developing chamber providing a discharge means for a fully developed batch of dough; and

means for rotating said rollers such that the developed dough is pulled through the nip of said rollers and out of said developing chamber upon the batch being fully developed into a proper consistency by said rotating developing agitator.

4,630,931

PROCESS AND APPARATUS FOR THE MIXING OF SLURRIES

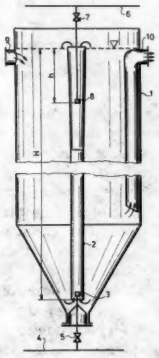
József Harsányi, Budapest; Janos Pintér, and Alajos Suri, both of Mosonmagyaróvár, all of Hungary, assignors to Magyar Aluminiumipari Troszt

Filed Feb. 25, 1985, Ser. No. 704,870

Claims priority, application Hungary, Feb. 28, 1984, 801/84

Int. Cl.⁴ B01F *13/02*

U.S. Cl. 366—107 **12 Claims**



1. A process for mixing a slurry, comprising the steps of:

introducing said slurry into a mixing tank having a conical bottom, an upright axis and a mixing pipe forming an air-lift pump extending axially in said tank and open at upper and lower ends in said tank;

injecting compressed air into said pipe at a first location close to said lower end for inducing an air-lift circulation of said slurry upwardly through said pipe by air lift action of said compressed air for a starting period of a mixing operation; and

terminating at least for a part of a subsequent period of said mixing operation the injection of compressed air into said pipe at said first location, and injecting compressed air into said pipe at a second location above said first location and within an upper third of the length thereof but below an upper eighth of said length to effect air lift circulation of said slurry through said pipe for the balance of said mixing operation.

4,630,932

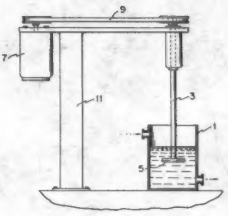
DISPERSING APPARATUS WITH WIRE WHEEL IMPELLER

Anthony J. Revelli, 395 Pinebrook Blvd., New Rochelle, N.Y. 10804, and Herbert Greenfield, 81-11-155 Ave., Howard Beach, N.Y. 11414

Filed Feb. 10, 1986, Ser. No. 827,895

Int. Cl.⁴ B01F *7/16*

U.S. Cl. 366—279 **27 Claims**



1. An improved apparatus for dispersing substances in a liquid having:

a vessel for holding liquid dispersing medium,

a rotatable stirrer shaft,

an impeller affixed to said shaft,

a motor capable of rotating said shaft,

a support structure for positioning said motor to rotate said shaft with impeller, and position said impeller within said vessel,

wherein the improvement comprises;

a dispersing impeller in the form of a disc of radially extending stiff wires, the parallel corrugated sides of said impeller formed from the outermost layer of the trim length of said wires, and the face of said impeller formed from the ends of said wires.

4,630,933

ELECTRICALLY OPERATED CLOCK AND SHAVER COMBINATION

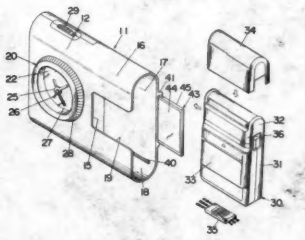
Sadashige Horii, Hikone, Japan, assignor to Matsushita Electric Works, Ltd., Japan

Filed Mar. 3, 1986, Ser. No. 835,784

Claims priority, application Japan, Mar. 20, 1985, 60-56597

Int. Cl.⁴ G04B *47/00*; B26B *19/28*

U.S. Cl. 368—10 **9 Claims**



1. An electrically operated clock and shaver combination which comprises:

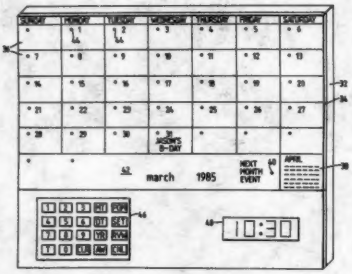
a casing provided with an electric clock and a battery source therefor;

a self-contained battery powered electric shaver detachably received in a compartment formed in said casing; and said clock and compartment being arranged in side-by-side relation.

4,630,934
CALENDAR WITH INDICATING MEANS

Amihudar Arber, 13 Mendele Street, Tel-Aviv, Israel

Filed Feb. 10, 1986, Ser. No. 827,750
Int. Cl.[4] G04B *19/24*; G09D *3/00*
U.S. Cl. 368—28 11 Claims



1. An electronic, attention attracting calendar comprising a base having a front surface for exhibiting conventional calendar information indicia;

means associated with said front surface for lighting through selected areas thereon;

said front surface is adapted to have a plurality of interchangeable paper sheets mounted thereon, such as a yearly calendar refill, each interchangeable paper sheet, divided into defined monthly date areas bearing a calendar information indicia in a small portion thereof and at least the majority of said areas each include an aperture through the sheet in a second small portion thereof at a predetermined location for registering with each other sheet and revealing said lighting means individually through each aperture, said apertures and indicia leaving a large portion of said areas for accommodating jotted-down information;

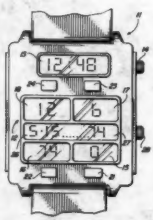
circuit means for selectively activating and deactivating said lighting means to project light through at least one of said selected areas, and

control and memory means for programming said circuit means.

4,630,935
OTHER TIME INSTRUMENT

Charles M. Zettek, 39 E. Main St., Hopkinton, Mass. 01748

Filed Sep. 4, 1984, Ser. No. 646,777
Int. Cl.[4] G04B *45/00*
U.S. Cl. 368—41 15 Claims



1. An electronic timepiece comprising:

clock means providing an output indicative of sidereal time;

clock display means for displaying time of day information provided by said clock means;

a chronograph means for automatically counting given elapsed sidereal time periods of greater than one hour and for accumulated totals of said periods greater than thirty one;

chronograph display means for continuously displaying the dynamic total of said periods counted by said chronograph means;

manually operable actuator means;

calculator means for counting sequential actuations of said actuator means;

other time display means for displaying the accumulated total of said sequential actuations counted by said calculator means;

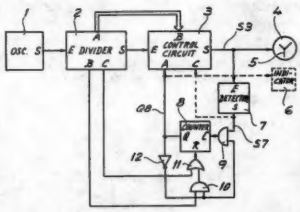
manual chronograph reset means for setting to zero the counted total of said time periods; and

other time reset means for setting to zero the counted sequential actuations of said actuator means.

4,630,936
ELECTRONIC TIMEPIECE

Claude-Eric Leuenberger, Chezard, Switzerland, assignor to Asulab S.A., Bienne, Switzerland

Filed Apr. 11, 1986, Ser. No. 850,784
Claims priority, application Switzerland, Apr. 12, 1985, 01571/85
Int. Cl.[4] G04B *9/00*
U.S. Cl. 368—66 5 Claims



1. An electronic timepiece comprising means for producing drive pulses, a motor having a rotor and means for turning the rotor through a set angle in response to each drive pulse, an autonomous source for supplying the drive pulse producing means with electric energy, means for producing an imminent end-of-life signal upon detecting the imminent end of the source's life and means for producing a warning signal in response to the signal from the detecting means, wherein the detecting means include means for producing a tally signal whenever the rotor does not turn correctly in response to a drive pulse, and a counter arranged to be incremented directly by said tally signal, with said counter producing, in response to a predetermined state, the imminent end-of-life signal.

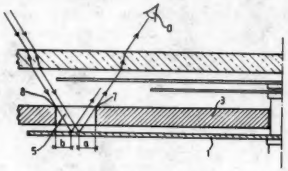
4,630,937
WATCHES OR THE LIKE EQUIPPED WITH A DISPLAY DEVICE OF THE DATE TYPE

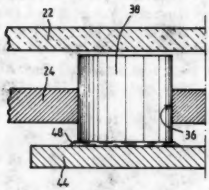
Claude Grossiord, Annecy, France, assignor to S. T. DuPont, Paris, France

Filed Oct. 10, 1985, Ser. No. 786,273
Claims priority, application France, Oct. 31, 1984, 84 16702
Int. Cl.[4] G04B *19/00*
U.S. Cl. 368—223 12 Claims

1. A watch or the like with a display device of the date type, wherein the symbols to be displayed are supported by a mobile support element (44) and are perceived by an observer through a window (36) provided in part of the watch, said watch being characterized by a bundle (38) of coherent optical fibers being mounted in said window such that one end of said bundle is disposed near the mobile support (44) while the other end is flush with a visible surface of an element of the watch and

where a film of low-viscosity liquid is interposed between said mobile support element (44) and the contiguous end of the





bundle of fibers (38) to provide an optical bridge between said support and said bundle of fibers.

4,630,938

METHOD OF DETERMINATION OF THERMAL CONDUCTION COEFFICIENT AND HEAT CAPACITY OF MATERIALS AND THE APPARATUS FOR MEASUREMENTS OF THERMAL CONDUCTION COEFFICIENT AND HEAT CAPACITY OF MATERIAL

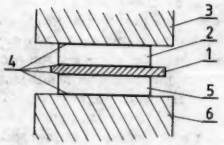
Ewa Piórkowska-Palczewska; Andrzej Galeski, and Marian Kryszewski, all of Lódź, Poland, assignors to Polska Akademia Nauk Centrum Badan Molekularnych i Makromolekularnych, Lodz, Poland

Filed Apr. 24, 1984, Ser. No. 603,559

Claims priority, application Poland, Apr. 27, 1983, 241663

Int. Cl.[4] G01N *25/00, 25/16;* G01K *17/00*

U.S. Cl. 374—44 7 Claims



1. A method for the determination of the heat conduction coefficient, heat capacity and thermal diffusivity of a material sample, comprising the measurement of a heat flux Q across the sample and the measurement of a momentary temperature difference ΔT between first and second opposite surfaces of said sample, which method is characterized in that the momentary temperature difference ΔT between both surfaces of the sample perpendicular to the direction of said heat flux is measured during a preferably linear applied continuous change of the temperature of said first surface of said sample, and supplying an amount of heat by a heater directly to said second surface of said sample in order to give rise to the heat flux Q across the sample, measuring said amount of heat supplied, while the values of the thermal conductivity coefficient, heat capacity and thermal diffusivity are determined on the basis of the following equation:

$$\lambda = \frac{(2Q - bc)l}{2\Delta T}$$

where

γ—thermal conductivity coefficient

$Q = \frac{P}{2s}$ — heat flowing across the sample per time unit per surface area s, where P is the power supplied to the heater

c—heat capacity of the sample

l—thickness of the sample

b—rate of change of the temperature of said first surface of said sample.

4,630,939

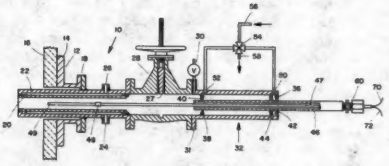
TEMPERATURE MEASURING APPARATUS

M. Dale Mayes, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 15, 1985, Ser. No. 798,500

Int. Cl.[4] G01N *25/00*

U.S. Cl. 374—135 13 Claims



1. An apparatus for measuring the temperature of a fluid environment within a vessel, said apparatus comprising:

(a) a chamber means that is sealingly connected to and which opens into said vessel to form a chamber which contains a portion of said fluid environment;

(b) a temperature sensing means which is movable between a first and a second position, whereby at said first position,

(i) at least a portion of said temperature sensing means is within said chamber, and

(ii) said temperature sensing means is out of contact with the remainder of said fluid environment, and whereby at said second position,

(iii) at least a portion of said temperature sensing means is exterior of said chamber and is in contact with said remainder of said fluid environment so as to obtain said temperature measurement;

(c) means for preventing substantial convective movement between said portion of said fluid environment and said remainder of said fluid environment when said temperature sensing means is moving between and at said first and second positions; and

(d) means for maintaining said portion of said fluid environment in said chamber at a cooler temperature than the temperature of said remainder of said fluid environment.

4,630,940

TEMPERATURE DISPLAY DEVICE FOR ATTACHMENT TO A WATER OUTLET

Ulrich K. Ostertag, and Reinhard F. Ostertag, both of Elbeweg 10, D-7000 Stuttgart 70, Fed. Rep. of Germany

Filed Aug. 7, 1984, Ser. No. 638,515

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1983, 3328782

Int. Cl.[4] G01K *1/14, 13/02*

U.S. Cl. 374—148 8 Claims

1. A device for measuring and displaying the temperature of

the liquid flowing out of a spout that has an interiorly threaded outlet, which device comprises

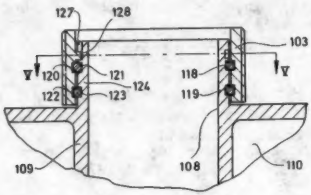
(a) a housing that includes

(1) an inlet end,

(2) an outlet end, and

(3) a liquid passageway connecting said inlet end to said outlet end of said housing,

(b) a connecting stud for connecting said spout to said housing, one end of said stud having exterior threading that is adapted to engage the interior threads on the outlet end of said spount and connecting means for connecting said connecting stud to the inlet end of said housing so that the connection therebetween will be fluid tight while still



permitting rotational movement relative to each other around the same axis, said connecting means comprising at least one O-ring seal that engages into a groove formed in the circumferential surface of said connecting stud as well as into a groove formed in an opposing circumferential surface of said housing,

(c) temperature sensor means mounted in said housing which can detect the temperature of the liquid flowing through said passageway,

(d) digital display means located on an exterior portion of said housing to display a visible indication of the temperature, and

(e) electrical means interconnecting said temperature sensor means with said digital display means.

4,630,941

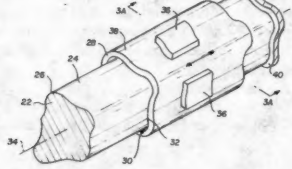
TUBULAR SQUEEZE BEARING APPARATUS WITH ROTATIONAL RESTRAINT

Timothy J. Chainer, Mahopac; Robert A. Scranton, and David A. Thompson, both of South Salem, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 581,748, Feb. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 470,658, Feb. 28, 1983. This application Oct. 24, 1985, Ser. No. 790,650

Int. Cl.⁴ F16C *32/06*

U.S. Cl. 384—1 **39 Claims**



1. An improved squeeze bearing apparatus comprising:

a rod-like bearing member having an exterior surface with a non-circular exterior perimeter, said perimeter comprising a plurality of outwardly projecting lobes;

a sleeve-like bearing member for receiving said rod-like bearing member, said sleeve-like bearing member having a non-circular interior bore perimeter symmetrical with said rod-like bearing member exterior perimeter; and

means for causing sufficient relative radial vibration between said sleeve-like bearing member and said rod-like bearing member to cause fluid in the clearance between said members alternately to be compressed and decompressed and thereby generate a load supporting force which is substantially inversely proportional to the number of said lobes in the squeeze bearing defined between said bearing members to resist relative rotation between said bearing members about said axis due to said compression and decompression of said fluid by said non-circular perimeters and to allow relative translation between said bearing members along said axis.

4,630,942

GUIDING APPARATUS

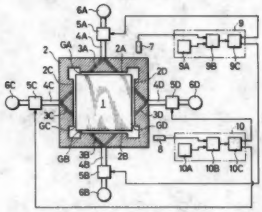
Nobuo Tsumaki; Hiromitsu Tokisue, and Hiroshi Inoue, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 18, 1985, Ser. No. 692,574

Claims priority, application Japan, Jan. 20, 1984, 59-7173

Int. Cl.⁴ B23Q *1/26*; F16C *29/00, 32/06, 33/02*

U.S. Cl. 384—8 **2 Claims**



1. A guiding apparatus comprising: a base having two pairs of opposing parallel surfaces; a slider supported above the base in a floating manner by means of hydrostatic bearings and linearly movable in a z-axis direction along said base; pressurized fluid supplying means for supplying pressurized fluid to said hydrostatic bearings; detecting means for detecting the displacement of said slider with respect to a designated coordinate position which is independent with said base and said slider in an x-axis and y-axis direction; memory means for storing a reference position of said slider with respect to said base in said x-axis and said y-axis direction; comparing means for comparing the values of the x-axis distance and y-axis distance measured by said detecting means with the respective values of the reference position in the x-axis direction and the y-axis direction stored in said memory means; and correcting and controlling means for adjusting the pressure of said pressurized fluid supplying means in accordance with the signal from said comparing means thereby correcting the position of said slider with respect to the designated coordinate position so as to enable accurate positioning of said slider along said base, said slider being a rectangular member, and said correcting and controlling means controlling two pairs of opposing gaps for forming hydrostatic fluid films for said hydrostatic bearings.

4,630,943

FERROFLUID BEARING AND SEAL APPARATUS

Philip Stahl, Holliston, Mass.; Donald F. Wilcock, Schenectady, and Dudley D. Fuller, Lake Hill, both of N.Y., assignors to Ferrofluidics Corporation, Nashua, N.H.

Continuation of Ser. No. 545,875, Oct. 27, 1983, abandoned. This application Feb. 26, 1986, Ser. No. 833,841

Int. Cl.⁴ F16C *33/74, 33/82*; F16J *15/40*

U.S. Cl. 384—133 **5 Claims**

1. A ferrofluid seal-radial-thrust bearing apparatus which comprises:

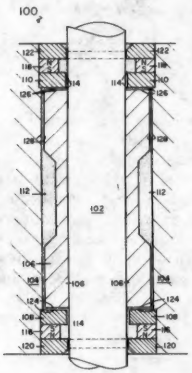
(a) a rotatable magnetically permeable shaft element;

(b) a housing which surrounds the shaft element and has an interior radial surface to form a radial bearing surface;

(c) a collar element secured to the shaft and having an exterior radial surface which is spaced apart from the interior surface of the housing to form a radial bearing cavity, the collar element having one and the other end generally with surfaces perpendicular to the axis of the shaft;

(d) first and second thrust bearing elements at the one and other end of the collar element and having lower and upper surfaces respectively, which surfaces form respectively with the end surfaces a lower and upper thrust bearing cavity surrounding the shaft element;

(e) separate, spaced apart upper first and lower second ferrofluid seal apparatus each of which comprises an annular permanent magnet about the shaft element and at least one pole piece which forms at the one end a radial gap with



the surface of the shaft element, the first and second ferrofluid seal apparatus adjacent respectively either end of the first and second thrust bearing elements so that the bearing cavities are not substantially exposed to a magnetic field; and

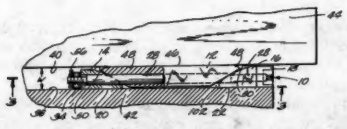
(f) ferrofluid which fills the radial thrust bearing cavities to act as a ferrolubricant and extends continuously to each of the radial gaps of the upper and lower ferrofluid seal apparatus to form at least one lower and upper O-ring ferrofluid seal about the surface of the shaft element to prevent the escape of the ferrofluid on the longitudinal outward movement of the ferrofluid from the thrust and radial bearing cavities and entrainment of gases in the ferrofluid during rotation of the shaft.

4,630,944

GIB FOR MACHINE TOOL

Robert L. Moehr, Mt. Clemens, Mich., assignor to The Cross Company, Fraser, Mich.

Filed Jul. 22, 1985, Ser. No. 757,156
Int. Cl.⁴ F16C *33/02, 29/12*
U.S. Cl. 384—39 **8 Claims**



1. A gib for use with a machine tool having first and second members and means for moving the first member along a first axis with respect to the second member, the second member having a planar surface extending along the first axis and the first member having a planar surface in opposing relation with the planar surface of the second member, said gib comprising:

first and second wedges, each of said wedges having a crowned surface and a base surface, said base surfaces comprising at least a portion of a first side of said gib;

a body positioned between said wedges having tapered ends and a side surface, said side surface of said body comprising at least a portion of a second side of said gib, each of said tapered ends of said body abutting the crowned surface of one of said wedges;

means for mounting said body and said first and second wedges for movement with said first member and within a space between said planar surfaces of said first and second members; and

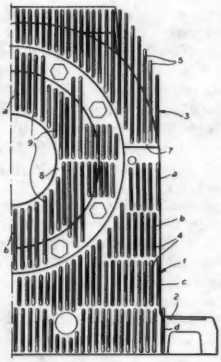
means directed along a second axis passing through said wedges and said body for both moving and guiding movement of said body relative to said wedges to urge said side surface of said body against one of said planar surfaces of said first and second members and for urging said base surfaces of said wedges against the other of said planar surfaces of said first and second members to align said planar surface of said first member along said first axis as said first member moves with respect to said second member.

4,630,945

BEARING HOUSING

Paul Gerling, Oberhausen, Fed. Rep. of Germany, assignor to Glyco-Maschinenbau GmbH, Essen, Fed. Rep. of Germany

Filed Apr. 16, 1985, Ser. No. 723,797
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1984, 3414476
Int. Cl.⁴ F16C *3/13, 37/00, 35/02;* F24H *3/12*
U.S. Cl. 384—320 **6 Claims**



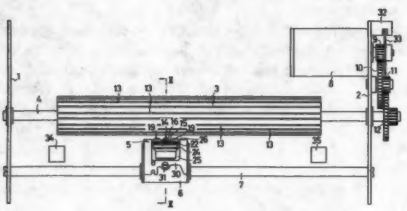
1. A plain-bearing housing for plain shaft bearings, comprising a bottom housing part and an upper housing part together defining a passage for a shaft and adapted to receive a plain bearing, said housing parts joining along a junction extending through said passage, said housing parts each being provided upon opposite axial sides thereof with cooling ribs lying substantially in parallel planes and uniformly spaced transversely apart, an upper portion of said upper part being additionally provided with cooling ribs, at least the ribs of at least one of said sides of said bottom housing part being provided in at least two rows perpendicularly aligned to the planes of said ribs, the ribs of said rows running vertical and perpendicular to said junction and said ribs being mutually staggered whereby ribs of one of said rows lie in line with spaces between the ribs of an adjoining row, and wherein ribs of said upper housing part are subdivided into respective rib registers.

4,630,946

DOT PRINTER OPERABLE IN HIGH RESOLUTION AND ORDINARY PRINTING MODES

Seiki Mizutani; Mikio Hayashi, and Kazuaki Ikeda, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1983, Ser. No. 539,925
Claims priority, application Japan, Oct. 8, 1982, 57-177434
Int. Cl.[4] B41J *3/02, 3/08*
U.S. Cl. 400—121 2 Claims



1. In a dot printer which is provided with a rotary drum having a plurality of parallel protrusions axially extending therealong on its outer circumferential periphery and a printing head movable back and forth in front of said rotary drum in directions perpendicular to the feeding direction of a recording medium, said printing head carrying a printing hammer mounted so as to face said protrusions of the rotary drum so that said printing hammer can be selectively driven to strike against respective ones of said protrusions to thereby form characters or the like on the recording medium, a printing method comprising the steps of:

driving said rotary drum, during the backward travelling of said printing head, to rotate in a direction of rotation opposite to the rotational direction of the rotary drum during the forward travelling of said printing head; and

driving said printing hammer such that dots are formed on the recording medium during the backward travelling of said printing hammer between dot rows formed during the forward travelling of said printing hammer so that printing is performed over one line through one reciprocating travelling of said printing head without advancing the recording medium throughout the printing of said one line.

2. In a dot printer which is provided with a rotary drum having a plurality of parallel protrusions axially extending therealong on its outer circumferential periphery and a printing head movable back and forth in front of said rotary drum in directions perpendicular to the feeding direction of a recording medium, said printing head carrying a printing hammer mounted so as to face said protrusions of the rotary drum so that said printing hammer can be selectively driven to strike against respective ones of said protrusions to thereby form characters or the like on the recording medium, a printing method comprising the steps of:

driving said rotary drum, during the backward travelling of said printing head, to rotate in a direction of rotation opposite to the rotational direction of the rotary drum during the forward travelling of said printing head such that the printing mode is selectable between a high resolution printing mode and an ordinary printing mode;

driving said printing hammer, in said high resolution printing mode, such that during the backward travelling of said printing hammer, dots are formed on the recording medium between dot rows formed during the forward travelling of said printing hammer so that printing is performed over one line through one reciprocating travelling of said printing head without advancing the recording medium throughout the printing of said one line; and

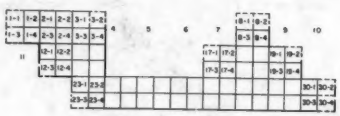
driving said printing hammer, in said ordinary printing mode, such that printing is performed on the recording medium over one line through each of the forward and backward travelling of said printing head.

4,630,947

ENLARGED PATTERN GENERATOR

Kunio Yoshida, Nara, and Fusao Makino, Kyoto, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 22, 1985, Ser. No. 693,125
Claims priority, application Japan, Feb. 16, 1984, 59-28028
Int. Cl.[4] B41J *11/44*; H04N *1/21, 1/17*
U.S. Cl. 400—124 7 Claims



1. Apparatus for enlarging an original pattern on a dot matrix comprising

means for defining four matrix positions corresponding to each dot included in said original pattern, and

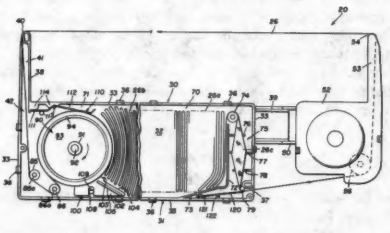
means for examining each dot included in said original pattern to determine whether three of the eight matrix positions adjacent to and surrounding said dot included in said original pattern are all unoccupied by dots belonging to said original pattern, said three positions being above, left-above and at left of said dot, or above, right-above and at right of said dot, or below, left-below and at left of said dot or below, right-below and at right of said dot.

4,630,948

INKED RIBBON CARTRIDGE

Ward L. Karns, Waynesboro, Va., assignor to Genicom Corporation, Waynesboro, Va.

Filed Sep. 30, 1982, Ser. No. 429,002
Int. Cl.[4] B41J *32/02, 32/28*
U.S. Cl. 400—196.1 15 Claims



1. An inked ribbon cartridge for a printing device comprising:

an endless ribbon,

an elongated housing having an interior cavity defined by top and bottom surfaces for storing said ribbon,

said housing having a port at one end thereof through which said ribbon exits,

a first rigid end support member in said housing located adjacent to said port, a second rigid end support member in said housing, a middle rigid support member in said housing disposed between said end support members,

a leaf spring member in engagement with all of said support members,

the middle support member being over center with respect to said end support members so that said spring member is biased tightly against said first end support member but

free to flex away therefrom in response to forces opposing the spring force,

said ribbon being drawn between said spring member and said first end support member out of said port, and

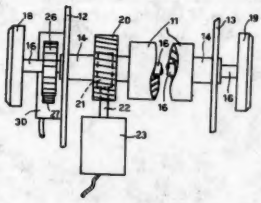
means to prevent said ribbon from being caught above or below said leaf spring between the spring and top or bottom housing surfaces comprising integral top and bottom tabs on the end portion of said spring member which is in contact with said first end support member, said top and bottom tabs extending to provide a total combined spring height thereat greater than the distance between the top and bottom surfaces of the housing to positively prevent said ribbon from becoming caught between the spring and said top and bottom surfaces as it exits from said housing, said top and bottom surfaces having openings therein respectively receiving said top and bottom tabs and said openings being sized to permit flexing movement by the end of said spring member.

4,630,949

DEVICE FOR CONTROLLING THE ROTARY MOVEMENT OF A PLATEN

Marcello Boella, Loranzè, and Ugo Carena, Ivrea, both of Italy, assignors to Ing C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Sep. 11, 1984, Ser. No. 649,491
Claims priority, application Italy, Sep. 12, 1983, 67938 A/83
Int. Cl.[4] B41J *19/92*
U.S. Cl. 400—568 **10 Claims**



1. In a device for controlling the rotary movement of a platen comprising a frame having two side plates for rotatably supporting said platen, an electric motor coupled to said platen, a knob rotatably mounted on said frame, and transducer means having a fixed portion and a movable portion, wherein said movable portion is operatively connected with said knob and cooperates with said fixed portion for generating signals indicative of the rotation of said knob and wherein control means respond to said signals to drive said motor in accordance with the rotation of said knob, wherein said electric motor is of bidirectional type and said signals are dependent on the direction of rotation of said movable portion, and wherein the direction of rotation of said electric motor is determined by the direction of rotation of said rotating member, the combination comprising:

a rotating member carrying the movable portion of said transducer means;

a support member for rotatably supporting said rotating member around a given axis; and

a spring member having an intermediate portion partially coiled around said axis and two end portions cooperative with two pegs fixed to said rotating member for urging said rotating member toward a rest position;

wherein said knob is fixed coaxially with a gear wheel, wherein said rotating member comprises a toothed sector engageable with said gear wheel and wherein said support member comprises a casing fixed to one of said two side plates adjacent to said platen;

wherein said motor can rotate at two different speeds, and wherein a lower speed and a higher speed are determined by lower rotations and higher rotations of said movable portion, further comprising

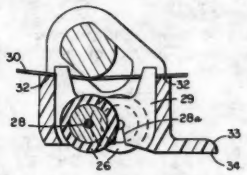
second resilient means for establishing on said rotating member an opposing force greater than the force of said spring member as said knob rotates said movable portion through said higher rotations to select the higher of said two speeds.

4,630,950

PAPER BAIL FOR A PRINTER AND ASSOCIATED METHODS OF OPERATION THEREOF

Mosi Chu, Setauket, and Meng S. Kuo, Ronkonkoma, both of N.Y., assignors to Primages, Inc., Ronkonkoma, N.Y.

Filed Aug. 29, 1984, Ser. No. 645,445
Int. Cl.[4] B41J *13/16, 13/20*
U.S. Cl. 400—639.1 **20 Claims**



1. Paper bail apparatus for operation with a platen of a printer comprising a paper bail shaft movable between an operative position adjacent the platen of the printer and an inoperative position remote from the platen, and a plurality of paper bail assemblies mounted on said paper bail shaft, each paper bail assembly comprising a frame non-rotatably supported on said shaft and movable for slidable displacement radially of the shaft in a plane substantially perpendicular to the axis of the shaft, spring means mounted on said frame for engaging said shaft to urge the frame in its direction of slidable displacement radially of the shaft to a lowered position on said shaft, and two rollers mounted on said frame for rotation about respective axes which are at offset locations for rollingly contacting the platen along two separate lines of contact under the urging of said spring means with the paper bail shaft in its operative position, said rollers being supported in the frame with their axes of rotation transversely offset from one another such that the rollers are circumferentially spaced on said platen.

4,630,951

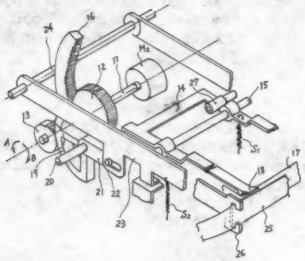
INK RIBBON AND CORRECTION TAPE LIFTING MECHANISM FOR A TYPEWRITER

Tomio Nii, Chofu, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1985, Ser. No. 762,510
Int. Cl.[4] B41J *35/22*
U.S. Cl. 400—697.1 **7 Claims**

1. A lifting mechanism for lifting ink ribbon and correction tape for a typewriter, comprising: a large gear wheel and a small gear wheel which are fixed to a driving motor shaft and which provide gear teeth at predetermined portions of the circumferences of the respective gear wheels, a ribbon lift arm including a gear wheel portion integrally connected thereto and an extended portion for supporting and lifting said ink ribbon, and providing a pivot point between said gear wheel portion and said extended portion, said gear wheel portion being arranged to engage at the time of lifting with the gear teeth of said large wheel, said ribbon lift arm pivoting about said pivot point at the time of lifting, and further comprising a tape lift arm including a gear wheel portion integrally connected thereto which is arranged to engage at the time of lifting with the gear teeth of said small gear wheel, a tape lift plate for supporting and lifting said correction tape and a direct

connection between said tape lift arm and said tape lift plate whereby rotary motion imparted to said tape lift arm is transmitted as lifting motion to said tape lift plate, said tape lift arm



rotating about a pivot point located between its gear wheel portion and an opposite end thereof whereat said tape lift plate is connected.

4,630,952

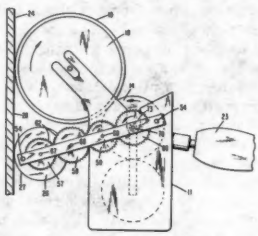
DESIGN PAINTING DEVICE WITH STABILITY AND INDEPENDENT DRIVE

Saul Elbaum, 11702 Kemp Mill Rd., Silver Spring, Md. 20902

Filed Apr. 29, 1985, Ser. No. 728,348

Int. Cl.[4] B43M *11/02*; B05C *17/02*

U.S. Cl. 401—48 **16 Claims**



1. A device for painting wallpaper-like patterns on walls comprising:

(a) a container for holding paint;

(b) a pattern roller for applying a pattern as it is manually driven by friction contact between itself and a wall;

(c) at least one feeder roller which is driven by friction contact with said pattern roller;

(d) a friction roller, independent of said pattern roller, for providing stability and avoiding lateral movements of said device across said wall;

(e) a driver roller for driving said feeder roller; and

(f) means for transferring rotary motion from said friction roller to said driver roller such that said feeder roller rotates at the same linear speed at which said pattern roller is manually driven along said wall.

4,630,953

PENCIL HOLDER

José E. Rocha Cabral, Avenida Tiradentes, 1595, Londrina, PR., and Oswaldo A. Correa Mellone, Rua Bandeira Paulista, 104 - Apt°. 71, Sao Paulo, both of Brazil

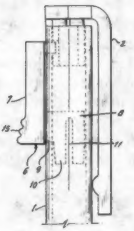
Filed Apr. 11, 1985, Ser. No. 722,143

Claims priority, application Brazil, Jun. 29, 1984, 8403212

Int. Cl.[4] B43K *21/06, 24/04, 23/00*

U.S. Cl. 401—83 **3 Claims**

1. Pencil holder, comprising a body or case having in one of its sides a slit that extends from the upper part to the lower part of the tip of the body or case, said slit being grooved in a manner similar to a scale a piston having an "L"-shaped section extending into said slit, said piston consisting of a rod, a head interconnected by an intermediary wall, the head being located inside the body or case and having in the middle a cavity for



receiving the graphite; said rod running parallel to the body along said slit; said rod also having in the middle thereof a slit causing the formation of two sides that receive at the top two projections, similar to crossbars that are arranged horizontally in relation to the rod and whose ends are separated to establish small lateral extensions in the form of an "L".

4,630,954

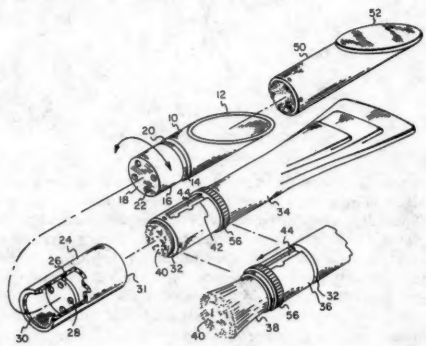
COSMETIC POWDER DISPENSER AND APPLICATOR

James E. Ladd, Jr., Rowayton, Conn., assignor to Laura Lupton, Inc, Rowayton, Conn.

Continuation-in-part of Ser. No. 752,133, Jul. 5, 1985. This application Sep. 25, 1985, Ser. No. 779,484

Int. Cl.[4] A46B *11/00, 11/04*

U.S. Cl. 401—123 **4 Claims**



1. A cosmetic powder dispenser and applicator comprising:

a first elongated hollow member having first and second opposite ends, the first end being open, the second end having a plurality of small spaced apart openings therein and being otherwise closed;

a hollow elongated capsule adapted to be filled with cosmetic powder, either face powder or blush, said capsule being closed at one end and open at the other, the capsule being removably slidable into and out of the first member and when inserted in the first member, having its open end adjacent the second end of the first member and its closed end closing the first end of the first member;

a second elongated hollow member having a first end with a like plurality of like openings and a second open end, the second member rotatably engaging the first member with the first end of the second member adjacent the second end of the first member, the first and second members having a first position of relative rotation at which the openings in the two members are aligned and a second

position of relative rotation at which the openings in the two members are out of alignment;

a third elongated hollow member having an open end detachably engaging the second end of the second member and having an opposite closed end; and

a brush having a plurality of essentially parallel bristles with powder applying tips, the brush being disposed in the third member with the tips adjacent the second member, said brush and said third member having manually operated cooperating means for establishing a first forward position when the capsule contains face powder at which the bristles will extend almost entirely out of the third member, a second forward position when the capsule contains blush at which the bristles extend out of the third member to a lesser extend then when the first position is used, and a third withdrawn position at which the brush is disposed within the third member.

4,630,955

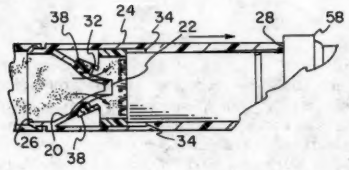
COSMETIC POWDER DISPENSER AND APPLICATOR

James E. Ladd, Jr., Rowayton, and David R. Jacobs, Norwalk, both of Conn., assignors to Laura Lupton Inc., Rowayton, Conn.

Continuation-in-part of Ser. No. 752,133, Jul. 5, 1985. This application Nov. 8, 1985, Ser. No. 796,230

Int. Cl.[4] A46B *11/00, 11/04*

U.S. Cl. 401—123 **5 Claims**



1. A cosmetic powder dispenser and applicator comprising:

a first elongated hollow member having a first open end and an opposite closed end with a plurality of small spaced openings therein;

a hollow elongated capsule, adapted to be filled with cosmetic powder, closed at one end and open at the other and removably slidable into and out of the first member, the capsule, when inserted in the first member, having its open end adjacent the second end of the first member and its closed end closing the first end of the second member;

a second elongated hollow member having first and second open ends, said first member having its closed end disposed in the first end of the second member, said second member having a cam in the first end having openings aligned with the openings in the closed end of the first member, said second member having a cam follower disposed slidably in the second member, said follower and said cam always being engaged, the follower and cam having a first normal position of engagement at which the follower seals the cam openings and a second momentary position of engagement at which the follower exposes the cam openings;

a third elongated hollow member having an open end:

a brush having a plurality of essentially parallel bristles with powder applying tips, the brush being disposed in the open third member end, the brush carrying end of the third member being removably disposed in the second end of the second member and engaging the follower, the second member being slidable back and forth along the third member between a first normal position at which the cam and follower are in the first position of engagement and a second momentary position at which the cam and follower are in the momentary second position of engagement.

4,630,956

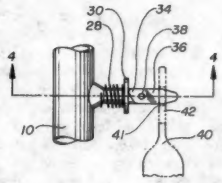
SCAFFOLDING CONNECTION AND RETENTION DEVICE AND METHOD

William E. Gilbreath, Huffman, Tex., assignor to Safway Scaffolds Company of Houston, Houston, Tex.

Filed Oct. 5, 1984, Ser. No. 657,979

Int. Cl.[4] E04G *7/00;* **F16B** *1/00, 21/00*

U.S. Cl. 403—49 **25 Claims**



1. A scaffolding connection and retention device for temporarily securing together a first elongate support member and a second elongate bracing member, comprising:

a stud affixed to said first member and having a longitudinal slot within a portion of the length of said stud;

a dog member pivotally mounted to said stud and rotatable within said slot, said dog member having a washer engaging end and bracing member receiving end;

a washer axially movable relative to said stud and having a transverse bar portion movable within said slot for engagement with said dog member;

said washer engaging end of said dog member having an outer surface configuration for substantially line contact engagement between said washer engaging end and said washer when said dog member is pivotably rotated is alignment with said stud for receiving said bracing member; and

a spring member substantially encompassing at least a portion of said stud and spaced between said first member and said washer for biasing said washer away from said first member and supplying at least a preselected biasing force on said dog member when positioned for receiving said bracing member.

4,630,957

BALL CUP FOR A BALL BEARING

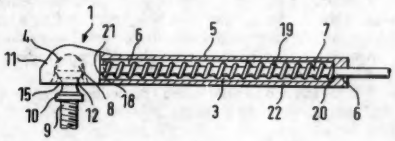
Erich Ausprung, Geislingen, Fed. Rep. of Germany, assignor to Springfix-Befestigungstechnik GmbH, Salach, Fed. Rep. of Germany

Filed Apr. 19, 1983, Ser. No. 486,323

Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3218962

Int. Cl.[4] F16C *11/00*

U.S. Cl. 403—76 **3 Claims**



1. A ball cup for a ball bearing comprising a ball cup body having a spherically formed ball-receiving chamber and said chamber having an annular restricted entrace whose diameter is less than the maximum diameter of said chamber and extending along the whole circumference of said chamber, said ball cup body having formed therein a pair of diametrically opposing spaced arcuate slits which substantially surround said

chamber and restricted entrance concentrically, and said slits defining with said restricted entrance a pair of arcuate bridge elements which are coextensive with said slits circumferentially of the chamber and restricted entrance, said bridge elements having their circumferential ends connected to said ball cup body and being elongated and radially narrow and therefore are yielding and somewhat stretchable radially and along their circumferential lengths, whereby a non-yielding ball bearing possessing substantially the maximum diameter of said chamber may pass through the restricted entrance and will be securely retained by the restricted opening within said chamber, said ball cup body having a flat surface lying in a plane parallel to said restricted entrance and spaced therefrom in a direction away from the center of said chamber, and the ball cup body having a tapered surface formed from said flat surface extending along the whole circumference of said chamber and being concentric with and leading to the restricted entrance and forming a guideway for the ball bearing being passed through the restricted entrance and said ball cup body being formed from a somewhat yielding plastics material.

4,630,958

ATTACHING COAXIALLY A MEMBER OR FITTING WITH A BORE THERETHROUGH TO A SHAFT

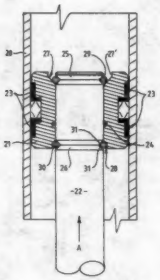
John S. McCallister, Christchurch, New Zealand, assignor to Sim-Tech Limited, Christchurch, New Zealand

Filed Sep. 29, 1983, Ser. No. 536,659

Claims priority, application New Zealand, Oct. 4, 1982, 202076

Int. Cl.⁴ F16B *21/16, 21/18*

U.S. Cl. 403—257 **23 Claims**



1. In a connection between a first member and a bore in a second member, wherein the periphery of the first member has a shape similar to that of the bore and the first member is dimensioned to have a sliding fit within the bore, the improvement comprising:

two spaced grooves formed around the periphery of the first member, each groove being defined by at least one face;

two spaced steps formed in said bore, each step being defined by at least one face and being provided by a region of enlarging diameter relative to said bore, said enlarging diameter region extending to the adjacent end of said second member; and

a compression clip located in and occupying a major portion of the circumferential length of each groove, said compression clip having a solid cross-section;

each step being located and having a configuration so that at least one groove is in register with one of said steps, said compression clip in said at least one groove is compressed between said at least one face of said at least one groove and said at least one face of said one step and the angle between the compressive forces acting upon said compressed clip and the longitudinal axis of the bore is in the range of 30°–70°, and the other of said steps is positioned relative to said other groove for providing a predetermined amount of binary cushioning in the range from zero to any positive dimension, between the first member and the second member.

4,630,959

CONNECTION OF TWO SPACER FRAME PROFILES AS WELL AS PROCESS AND APPARATUS FOR THE ESTABLISHMENT OF THE CONNECTION

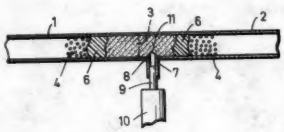
Siegfried Glaser, Beverungen, Fed. Rep. of Germany, assignor to Helmut Lingemann GmbH & Co., Fed. Rep. of Germany

Filed Aug. 26, 1983, Ser. No. 526,591

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1982, 3233399

Int. Cl.⁴ F16B *12/04*; B29C *31/06*

U.S. Cl. 403—266 **14 Claims**



1. Connection of two spacer frame hollow profile pieces that are usable for production of an insulating glazing, comprising:

each of said two hollow profile pieces having spaced apart top and bottom walls and spaced apart side walls to provide an interior space within each of said profile pieces, a first portion of said interior space within each of said profile pieces being filled with a drying agent to define a second portion of said interior space within each of said profile pieces adjacent to outer edges of each of said profile pieces;

first and second plugs being disposed in respective ones of said two hollow profile pieces within an inner section of said second portion of said interior space against said drying agent to retain said drying agent within said first portion of each of said profile pieces;

said outer edges of said profile pieces being set against one another in an abutting arrangement so that said second portions of said interior spaces are in communication with each other to provide a cavity extending on both sides of said abutting arrangement from said first plug to said second plug;

said cavity being closed off on opposite sides thereof by said first and second plugs respectively;

connecting means being injectable through at least one of said walls of said profile pieces for connecting said profile pieces together;

said connecting means including a one-piece connecting body being seated within said cavity within said profile pieces, said connecting body bridging across said abutting arrangement and being disposed against said first and second plugs for positioning on both sides of said abutting edges;

said connecting body including adhesive means to adhere adhesively to inner wall surfaces of said top, bottom and side walls of each of said profile and to facing walls of said first and second plugs;

said adhesive means including a hardened fusion adhesive third plug; and

means for injecting said third plug as a liquid through said one of said walls of said profile pieces into said cavity.

4,630,960

ADJUSTABLE HERRINGBONE LOCK JOINT

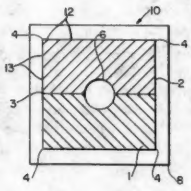
James B. Reeves, Jr., 1315 Whitman Dr., Glen Burnie, Md. 21061

Continuation-in-part of Ser. No. 512,540, Jul. 11, 1983, Pat. No. 4,531,926, Ser. No. 611,111, May 17, 1984, Pat. No. 4,559,028, and Ser. No. 647,437, Sep. 5, 1984, Pat. No. 4,571,218. This application Dec. 27, 1984, Ser. No. 686,826

The portion of the term of this patent subsequent to Feb. 18, 2003, has been disclaimed.

Int. Cl.[4] F16B 5/00

U.S. Cl. 403—345 29 Claims



1. A mechanical joint, comprising:

first and second joint members having mating joint surfaces with a dividing line;

a first set of a plurality of alternating and parallel ridges and notches on one side of said dividing line for each of said members, so that said members may be placed together with the mating surfaces contacting each other and the ridges and notches of one member interengaging with the notches and ridges of the other member, respectively, in a first assembly position, moved away from each other to disengage the ridges and notches so that the surfaces may be shifted laterally of the extent of the ridges and notches to a new position wherein they may be re-engaged at a second assembly position offset from the first assembly position, and in a like manner adjusted to a plurality of additional assembly positions that are different from each other;

a second set of a plurality of alternating and parallel ridges and notches on each of said members on the other side of said dividing line so arranged that the ridges and notches of the second set will interengage with each other respectively for the two members in each of said assembly positions;

said first set and second set of ridges and notches each being arranged at an acute angle with respect to said dividing line and at an angle to each other to thereby prevent relative movement between said members along their mating surfaces in any direction when in any one of said assembly positions; and

fastener means for holding said members in their assembled positions, and said fastener means being selectively releasable to permit movement of said mating surfaces of said members perpendicular to said mating away from each other so that they may be shifted and reassembled in another of said assembly positions to thereby provide a secure and adjustable joint between said members.

4,630,961

TRAFFIC INTERSECTION

Horst Hellwig, Im Saales 18, D-6338 Huettenberg-Rechtenbach, Fed. Rep. of Germany

Filed Feb. 29, 1984, Ser. No. 584,888

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224429; PCT Int'l Appl., Jun. 16, 1983, PCT/DE83/00111

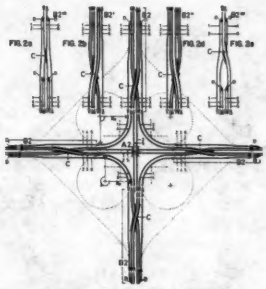
Int. Cl.[4] E01C 1/04

U.S. Cl. 404—1 11 Claims

1. An intersection for handling traffic from a plurality of intersecting roads, each of said roads having oppositely directed lanes for oppositely traveling traffic, said intersection comprising:

a cental zone into which each of said roads extends, said lanes being divided into incoming lanes relative to said zone and outgoing lanes relative to said zone;

an interchange zone associated with each of said roads entering said central zone, each interchange zone being outside of said central zone and including an overpass for exchanging the relative position of at least two of said oppositely directed lanes for each of said roads, said overpass being used to exchange all lanes which require exchanging in said interchange zone; and



wherein said lanes are divided into main traffic lanes and access lanes for each of said roads, said access lanes connecting to said main traffic lanes at points of conflict, and said main traffic lanes of certain of said roads being connected to provide a main traffic stream, there being at least as many incoming lanes in each road, prior to said overpasses, as the directional choices available and all points of conflict on said incoming lanes being positioned prior to said overpasses and on the same level, all points of conflict on said outgoing lanes being positioned after said overpasses whereby the choice of direction is selected by entering a unique lane for a particular direction prior to said interchange zone.

4,630,962

DRAINAGE CHANNEL WITH LOCKING GRATE

Roland Thomann, Hehlstrasse 6, 8135 Langnau; Heinz Witschi, Am Luzernbach 9, 6043 Adligenswil; Heinz-Deiter Brink, Oberfeldweg 153, 3322 Mattstetten, and Markus Amann, Wieswaldweg 36, 8135 Langnau, all of Switzerland

Continuation-in-part of Ser. No. 506,245, Jun. 20, 1983, abandoned. This application Aug. 16, 1985, Ser. No. 766,088

Claims priority, application Switzerland, Nov. 23, 1982, 6826/82

Int. Cl.[4] E01F 5/00

U.S. Cl. 404—2 9 Claims

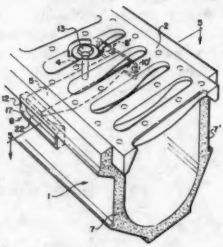
1. A drainage channel including an elongate concrete channel body having an upwardly directed opening; a grate for being positioned in and covering the opening of said channel body; and anchor means for detachably securing said grate to said channel body, said anchor means comprising:

(a) a bolt rotatably mounted on said grate and having an end extending into said channel body;

(b) a locking strap carried transversely by said bolt for rotation thereon within said channel body into and out of proximity to the walls of said channel body; and

(c) a locking block carried in a recess in the walls of said channel body and cooperating with said locking strap and including means for securing said locking strap within said locking block upon rotation of said locking strap in one direction and for detaching said locking strap from said locking block upon rotation in the other direction

whereby said grate can be easily and quickly secured to or detached from said channel body; said locking block comprising an insert positioned in said recess and interposed between the concrete walls of the channel body and locking strap to protect the concrete walls of the channel



body from breaking and crushing caused by tightening the locking strap within the locking block and flexure of the channel structure caused by vertical loading of the channel and prevent loosening said locking strap within said locking block.

4,630,963

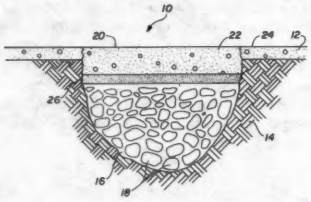
POLYMER CONCRETE BY PERCOLATION

Ransome J. Wyman, 821 Camino Colibri, Calabasas, Calif. 91302

Filed Sep. 5, 1984, Ser. No. 647,597

Int. Cl.[4] E01C *7/30*; C08G *18/26*

U.S. Cl. 404—75 **14 Claims**



1. A method for the repair of a roadway having a cavity therein, comprising:

filling the cavity with an aggregate;

forming a solution comprising from about 0 to 8% of an OH terminated polyether polyol having a molecular weight of less than 2,000, from about 23 to 35% of an organic polyisocyanate from about 38 to 58% of a solvent having a specific gravity of greater than 1, from about 8 to 16% of a diaminotetrahydroxyl polyol, from about 0.15 to 0.3% to an organic mercury catalyst and from about 0 to 1% of an organic lead catalyst; and

dispersing the solution through the aggregate and allowing the solution to percolate therethrough to fill the cavity.

4,630,964

SUBGRADING MACHINE

J. Dewayne Allen, Paragould, Ark., assignor to Allen Engineering Corporation, Paragould, Ark.

Filed Oct. 22, 1984, Ser. No. 663,196

Int. Cl.[4] E01C *19/15*

U.S. Cl. 404—96 **19 Claims**

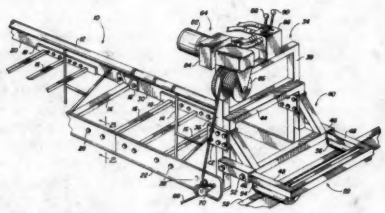
1. A subgrading machine for precisely levelling and contouring the subgrade within an area having first and second parallel-oriented forms including parallel upper surfaces vertically spaced above the subgrade and defining a form surface plane, comprising:

a. a triangular truss frame having a length less than the spacing between the first and second forms, a linear, load bearing front edge, and a linear, load bearing rear edge spaced apart from and oriented parallel to the front edge and defining a load bearing frame base plane, said frame being terminated by first and second end sections each having spaced apart front and rear surfaces extending vertically upward from the frame base plane;

b. a rigid, load bearing grading blade mechanically secured to and extending along the load bearing front edge of said frame for engaging the subgrade, said blade including a curved blade section having an upper surface extending above the frame base plane and a lower surface protruding below the frame base plane;

c. an adjustable end bracket coupled to the front and rear surfaces of each of said end sections for controlling the elevation of the frame to position the frame base plane below the form surface plane and for transferring the weight of said frame to the upper surface of said forms, including

i. form contact means extending laterally outward from said end sections and having a lower surface contacting the upper surface of the adjacent forms for maintaining a parallel alignment between the frame base plane and the form surface plane;



ii. a first roller assembly having first and second spaced apart cylindrical rollers rotatably coupled to the lower surface of said form contact means for establishing rolling contact between said adjustable end bracket and the upper surface of an adjacent form, wherein each of said rollers includes an axis of rotation oriented parallel to the front edge of said frame;

iii. frame elevation control means for coupling said form contact means to said end section at a selectable vertical position to vary the spacing between the frame base plane and the form surface plane to thereby determine the grading depth of said grading blade with respect to the subgrade; and

d. a winch system for advancing the machine into the uncontoured subgrade, including

i. first and second winches coupled to the end sections of said frame for reeling in first and second winch cables to generate a traction force;

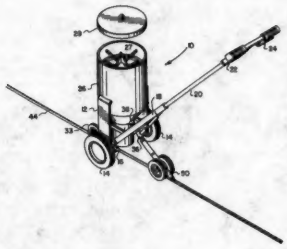
ii. first and second pulleys coupled to the ends of said frame at an elevation intermediate to the upper and lower surfaces of said grading blade for lowering the elevation of the traction force exerted on said frame by said winch cables to a level in proximity to the subgrade and for causing the traction force to be distributed along the length of the load bearing front edge of said frame and through said grading blade into the subgrade to level and contour the subgrade as the machine is advanced by said winch system.

4,630,965

APPARATUS FOR SEALING PAVEMENT SEAMS

Hung T. Nguyen, Farmers Branch; Vu Q. Dang, Coppell; Henry H. Duval, Jr., and Donald J. Kennedy, both of Dallas, all of Tex., assignors to Cleanseal Systems, Inc., Dallas, Tex.

Filed Jan. 14, 1985, Ser. No. 691,287
Int. Cl.[4] E01C *23/09, 19/12*
U.S. Cl. 404—107 11 Claims



1. An apparatus for filling the gap between pavement sections with an asphaltic emulsion sealing composition comprising:

a wheeled support platform;

a storage container disposed on said wheeled support platform for containing an asphaltic emulsion sealing composition;

applicator means coupled to a bottom portion of said storage container for coupling a stream of said asphaltic emulsion sealing composition into said gap between pavement sections; and

means for preventing gelling of said asphaltic emulsion sealing composition in response to movement of said wheeled support platform, said means for preventing gelling comprising a substantially vertically disposed rotatable shaft in said container driveably connected to said wheeled support platform;

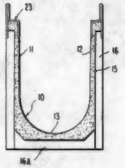
said shaft having a first agitator disposed within the bottom portion of said container for propelling asphaltic emulsion upward from the bottom of said container, and a second stirring means disposed above said first agitator for stirring said asphaltic emulsion.

4,630,966

DRAINAGE CHANNEL

Peter Karbstein, Neumünster, Fed. Rep. of Germany, assignor to ACO Polymer Products, Inc., Chagrin Falls, Ohio

Filed Nov. 7, 1985, Ser. No. 795,953
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 8435101[U]
Int. Cl.[4] E01C *11/22*
U.S. Cl. 405—118 7 Claims



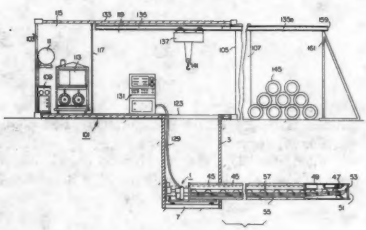
1. A drainage channel having a body which is U-shaped, with two complementary and opposite ends which are capable of form interlocking with another channel body placed adjacent thereto in abutting and mating relationship, one of said complementary ends having skewed surface sections (16), and the opposite of said ends having skewed surface sections (18) and (19), said channel having side walls (11, 12) and a channel trough (13), said skewed surface sections being capable of fitting together holohedrally with adjacent drainage channels, each of said side walls being fitted with an edge protective frame device (23) formed of a web resting on top of each of said side walls and two anchor legs extending downwards therefrom and linked by the web, at least one of said legs being flush with its respective side wall of the channel, the upper part of each of said channel side walls extending between the two anchor legs, said device having a mounting leg extending upwardly from the outer edge of the web and adapted to receive a channel cover, said edge protective device being formed of sheet metal bent to form said web (27) and said inner anchor leg (28) and folded to form a double sheet metal layer mounting leg (26).

4,630,967

ARRANGEMENT FOR UNDERGROUND ADVANCE DRIVING OF PIPE TRAINS COMPOSED OF INDIVIDUAL PIPE LENGTHS

Gerd Soltau, Artlenburger Landstr. 15, D-2120 Luneburg, Fed. Rep. of Germany

Filed Mar. 22, 1985, Ser. No. 714,768
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1984, 3439433; Oct. 30, 1984, 3439620
Int. Cl.[4] F16L *1/02*
U.S. Cl. 405—184 11 Claims



1. An apparatus for laying underground segments of pipeline along street routes from within jacking shafts disposed in the ground along the street comprising jacking shafts comprised of tubular concrete rings provided in the ground allowing access for jacking pipeline segments and for serving later as manholes, the jacking of the pipeline segments being effected by a jacking apparatus lowerable into the jacking shaft and operable therewithin such that inside an interior portion thereof and restricted thereto, the jacking apparatus can be rotated and steered in any desired jacking direction, whereby said apparatus is particularly adapted to lay sewer pipes and mains having non-man-accessible pipe cross-sections.

4,630,968

REALIZATION PROCEDURE OF A MODULAR SYSTEM PARTICULARLY SUITABLE FOR USE OFF COASTS

Hubert Berthet; Noël Laugier, both of Arles, and Bernard Ricome, Carnon sur Mer, all of France, assignors to Institut Francais du Petrole, Malmaison, France

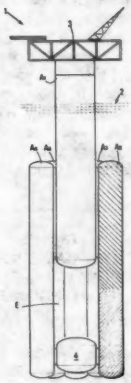
Filed Oct. 17, 1984, Ser. No. 661,931
Claims priority, application France, Oct. 17, 1983, 83 16482
Int. Cl.[4] B63B *35/44*
U.S. Cl. 405—195 4 Claims

1. A method for constructing a modular system suitable for use offshore, said system comprising a set of cylinders rididly linked together, said set comprising at least one central cylinder and a plurality of peripheral cylinders, said method comprising the following successive stages:

(a) joining together, on a quay, at least two first peripheral

cylinders, said two peripheral cylinders being carried out on at least one support cradle;

(b) joining the central cylinder to said at least two first peripheral cylinders to form a unit of assembled cylinders;



(c) placing the unit of a assembled cylinders in the water; and

(d) after said unit is placed in the water, further joining any remaining peripheral cylinders of said plurality of cylinders to said unit.

4,630,969

ARTIFICIAL ISLAND

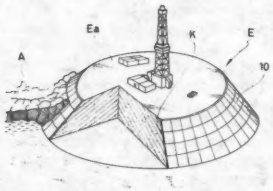
Masanao Oshima, Tokyo, and Nobuyoshi Yashima, Funabashi, both of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1984, Ser. No. 593,720

Claims priority, application Japan, Apr. 18, 1983, 58-66981

Int. Cl.⁴ E02D *21/00*

U.S. Cl. 405—217 **1 Claim**



1. An artificial island comprising:

a mass of solid material defining an inclined surface about the periphery thereof;

a plurality of plate body sheets having a top surface and an underside;

a plurality of surface protection members covering said inclined surface, each of said surface protection members comprising a plurality of plate body sheets, and anchoring means for fixing said plate body sheets to said inclined surface fixed to and downwardly extending from the underside of said plate body sheets through said inclined surface, said anchoring means being secured within said mass of solid material, said anchoring means including a grid comprising a plurality of interconnected supports fixed to and depending downwardly from said plate body sheets and secured within said mass of solid material.

4,630,970

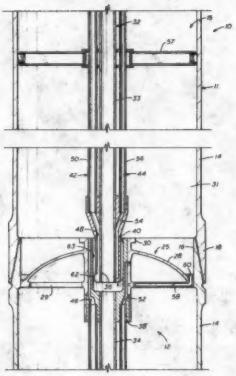
BUOYANCY SYSTEM FOR SUBMERGED STRUCTURAL MEMBER

Richard H. Gunderson; Terry N. Gardner, both of Houston, Tex., and Peter J. D. Guile, Berkshire, England, assignors to Exxon Production Research Co., Houston, Tex.

Filed Sep. 13, 1985, Ser. No. 775,913

Int. Cl.⁴ E02B *17/00*; B63B *35/44*

U.S. Cl. 405—224 **30 Claims**



1. A structural member adapted for use in a body of water, comprising:

an elongate load bearing wall portion, said wall portion defining a central channel extending the length of said structural member, said central channel being isolated from said body of water by said wall portion;

a plurality of bulkheads in the interior of said wall portion, said bulkheads dividing said central channel into a series of buoyancy cells adapted to contain gas;

an access tube extending along said central channel and passing through at least some of said bulkheads, said access tube being adapted to contain a column of liquid; and,

means for establishing fluid communication between the interior of at least some of said buoyancy cells and the interior of said access tube, whereby fluids may be transferred between said buoyancy cells and the interior of said access tube.

4,630,971

APPARATUS FOR ANCHORING ROCK AND THE LIKE

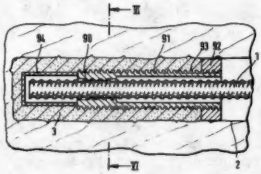
Thomas Herbst, Wessling, and Lorenz Schitzler, Pöcking, both of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 27, 1986, Ser. No. 823,055

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1985, 3503012

Int. Cl.⁴ E21D *20/00*

U.S. Cl. 405—260 **27 Claims**



1. Anchoring apparatus for insertion into a borehole in a

rock stratum for supporting an exposed rock surface or wall such as in a rock tunnel or a rock excavation, comprising a tension member in the form of an axially elongated steel anchor rod formed of at least one axially extending part with force transmission ribs on the outer surface of said rod and said rod having a pair of opposite ends spaced apart in the axial direction, said ribs located along a helically extending line around the axis of said rod and forming at least a partial thread, an anchoring element mounted on said rod, said anchoring element having an inside surface arranged to encircle and engage the surface of said rod, said inside surface having inwardly directed projections, said projections forming grooves therebetween so that said grooves can receive said ribs on said rod with said projections arranged to contact said ribs, said anchoring element in engagement with said rod being arranged to be axially movable relative to said rod while a predetermined axially directed tensile force on said rod is exceeded, wherein the improvement comprises that said anchoring element is formed of a material having a higher strength than the material forming said rod, said projections have flanks defining said grooves therebetween arranged to contact said force transmission ribs, and when the predetermined axially directed tensile force is exceeded, during relative axial movement between said anchoring element and said rod, said projections on said anchoring element cut and displace the portion of said force transmission ribs contacted by the flanks of said projections.

4,630,972

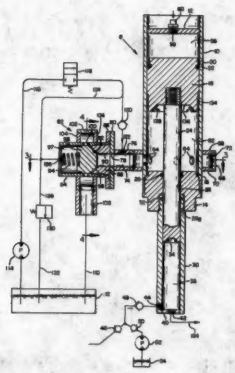
IMPULSE INJECTOR APPARATUS

Frank R. Kinnan, Winston, Oreg., assignor to Utilitech, Incorporated, Sam Ramon, Calif.

Filed Oct. 29, 1984, Ser. No. 666,292

Int. Cl.⁴ E02D *3/12*; F15B *7/00*

U.S. Cl. 405—269 **7 Claims**



1. Intensified impulse injector apparatus comprising:

an elongate cylinder,

an actuating piston mounted for reciprocation within said cylinder,

a chamber within said cylinder defined between one end of the piston and one extermity of said cylinder and a captured compressible gas supply within this chamber,

another chamber within said cylinder defined between the opposite end of said piston and an opposite extremity of said cylinder,

a pressure fluid conduit connected to a supply of pressure fluid,

a drain conduit connected to a drain for the drainage of fluid,

control means for first selectively connecting the pressure fluid conduit to said other chamber to admit pressure fluid to said other chamber to cause movement of said actuating cylinder towards said one extermity of said cylinder and compression of said captured gas supply and for then selectively connecting the drain conduit to said other chamber to allow dumping of pressure fluid from said other chamber with said actuating piston moving toward said opposite extermity of the cylinder under the urging of expansion of said captured gas supply, said control means comprising aperture means in the side of said cylinder adjacent its said opposite extermity and said piston having a side that moves into covering relation over said aperture means on moving adjacent said opposite extremity of said cylinder,

means forming an elongated material-holding chamber for holding injection material having an oulet at one end and an injection piston movable within said material-holding chamber toward said one end of the material-holding chamber to cause discharge of the material from said outlet, and

means connecting the actuating piston and injection piston whereby movement of the actuating piston toward said opposite extremity of said cylinder produces movement of the injection piston toward said one end of the material-holding chamber.

4,630,973

PERIPHERALLY FLEXIBLE PROP ARCH FOR MINING TRACKS, TUNNELS OR THE LIKE

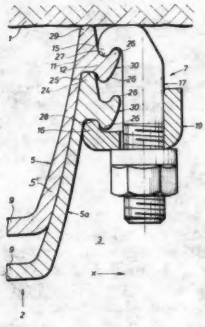
Peter Heintzmann, Bochum; Manfred Koppers, Duisberg; Karlheinz Bohnes, Bochum, and Lothar Domanski, Oberhausen, all of Fed. Rep. of Germany, assignors to Bochumer Eisenhuette Heintzmann GmbH & Co. KG, Bochum, Fed. Rep. of Germany

Filed Jun. 4, 1984, Ser. No. 617,522

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320829

Int. Cl.⁴ E21D *11/18*

U.S. Cl. 405—288 **12 Claims**



1. A peripherally flexible prop arch for mining tracks, tunnels or the like for propping a rock structure or a backfill material, comprising at least two elongated gutter-shaped segments partially overlapping one another to define an overlapping region and having end portions superposed one on another and extended in the same direction and having congruent cross sections; and clamping devices each applied to said segments at said overlapping region to clamp said segments to each other, the end portion of each segment being directed toward the rock structure and having an end, each segment further having a bottom portion directed away from the rock structure and a lateral flange offset from said end portion in the direction toward said bottom portion, each flange being formed with a first elongated groove facing and open toward said rock structure and extended along the elongation of the segment and an opposite second elongated groove facing toward said bottom portion, each clamping device including at an upper end thereof facing the rock structure a hook designed

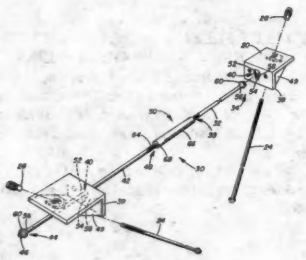
so as to completely fill said first groove and engaged in said firs groove, and at a lower end thereof a claw-shaped portion engaged in said second groove, the lateral flange of each segment including a flange edge portion extended toward the rock structure and limiting said first groove from outside, said edge portion being spaced from said end of the end portion in the direction toward said bottom portion at least such a distance that the hook of said clamping device is engaged with said edge portion and said hook does not extend beyond the end of the end portion of said one segment in the direction toward said rock structure at any place along the elongation of said one segment.

4,630,974

ROOF SUPPORT SYSTEM FOR A MINE AND METHOD FOR PROVIDING THE SAME

James L. Sherman, Bethel Park, Pa., assignor to Price & Adams, Pittsburgh, Pa.

Filed Mar. 13, 1985, Ser. No. 711,302
Int. Cl.[4] E21D *21/00*
U.S. Cl. 405—288 14 Claims



1. An improved roof support system for a mine or the like comprising,

a pair of plates secured to a roof of said mine at opposite sides thereof and adjacent opposing ribs of said mine,

an elongated reinforcing member extending horizontally and transversely of said mine between said pair of said plates,

said reinforcing member having a first rod means and a second rod means and adjustable means for joining said first rod means and said second rod means to vary an overall length of said reinforcing member,

at least one of said first and second rod means having an enlarged bolt head end portion formed integral therewith,

at least one of said pair of plates having an opening therein to receive said enlarged bolt head end portion of said reinforcing member therethrough,

at least one of said plates having a surface adjacent said opening operable to abut at least a part of said enlarged bolt head of said reinforcing member, and

said reinforcing member arranged to exert a tension on said first plate and said second plate as said bolt head end portion is urged against said respective plate surface, said tension being varied by rotation of at least one of said rod means in said adjustable means.

4,630,975

AIR ENCASEMENT SYSTEM FOR TRANSPORTATION OF PARTICULATES

John H. Becker, 100 Orchard St., Auburn, N.Y. 13021

Continuation-in-part of Ser. No. 540,313, Oct. 11, 1983, abandoned. This application Dec. 18, 1984, Ser. No. 683,012
Int. Cl.[4] B65G *53/18, 53/28, 53/60*
U.S. Cl. 406—85 25 Claims

1. A method for transporting particulates which includes:

moving a transport air stream through a pipeline;

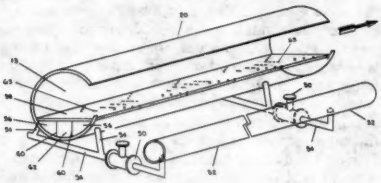
entraining in said transport air stream the particulates;

introducing energizing air in opposed directions into the pipeline at a rate and in an amount to form a forward leaning pulsating-air encasement between the inner wall of the pipeline and the transport air stream,

wherein the pulsating effect is created by:

flowing the energizing air into a chamber; and

discharging the air from the chamber into the pipeline through a plate having a plurality of orifices wherein the



air flows at various rates, pressures and angles with reference to a vertical plane;

maintaining the velocity of the energizing air stream at a greater rate than the velocity of the transport air stream whereby the precipitation of the particulates from the transport air stream is inhibited; and

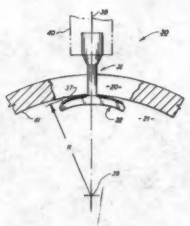
removing the particulates from the air stream.

4,630,976

CUTTING TOOL

Henry Belcher, 61 Somers Dr., Fulton, N.Y. 13069

Filed May 20, 1985, Ser. No. 735,596
Int. Cl.[4] B23P *15/28;* B26D *3/16*
U.S. Cl. 407—65 11 Claims



1. A cutting tool for removing unwanted material from the interior of a welded pipe joint that is being repaired wherein a portion of the weld material has been removed from the joint to provide a repair opening into the pipe passage, said tool including

a cutting segment having cutting teeth formed along a convexly curved top surface thereof, said segment being curved along its length with the radius of curvature of the top surface being less than that of a pipe section forming the weld joint, said segment having a width that is less than the width of the weld joint,

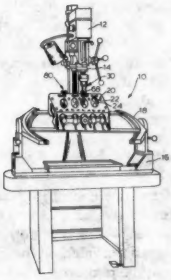
an elongated shank having a width substantially equal to that of the cutting segment, said shank being connected at one end to the top surface of the segment and extending radially therefrom, the axis of said shank bisecting the segment and passing through its radius of curvature, whereby the segment can be passed through the repair opening into the pipe passage and rotated inside the passage by turning the shank.

4,630,977

VALVE SEAT RESURFACING APPARATUS

Theos E. Theofanous, 4747 Kester Rd., Winston-Salem, N.C. 27103

Filed May 28, 1985, Ser. No. 738,342
Int. Cl.[4] B23B 47/60
U.S. Cl. 408—83.5 1 Claim



1. An apparatus for sequentially and separately resurfacing cylinder head valve seats in an engine cylinder head having the seats formed therein and corresponding valve stem guide holes, comprising:

(a) a base mounting positionable support means for supporting said head with a selected valve seat and its corresponding valve stem guide hole in a selected position in which the axis of said guide hole is substantially vertical;

(b) drive means supported by said base above said positionable support means and having associated therewith an axially movable rotating chuck rotatable about a fixed vertical axis with means for releasably receiving a Morse tapered shaft of a tool to be driven;

(c) a constant velocity universal joint having:

(i) a drive shaft having at one end a Morse taper releasably secured in, supported by and driven by said chuck and at the opposite end a spline section rotatable around said fixed axis and concentric with said taper and section;

(ii) a driven shaft; and

(iii) universal connecting means between said drive shaft and driven shaft comprising:

(aa) an inner ball housing having a central bore portion mounted on, concentric with, supported and driven by said drive shaft spline section about said fixed axis and surrounding said central bore portion a first set of ball bearing receiving recesses;

(bb) a ball bearing mounted in each of said recesses;

(cc) a ball retainer surrounding and vertically movable relative to said inner ball housing and providing a ball retention passage for each said ball bearing;

(dd) an outer ball housing having a first driven portion surrounding and vertically movable relative to said inner ball housing and ratainer and formed with a second set of ball bearing receiving recesses mounting and utilizing said ball bearings with said retainer to support said outer ball housing and form a driving connection with said inner ball housing in which said inner and outer ball housings are prevented from rotating relative to each other and having a second portion integrally formed with said drive shaft; and

(ee) means for preventing end play between said outer and inner ball housings comprising a ball mount member having at one end a shank mounting a spring located in a bore formed in and concentric with said spline section and at the opposite end a rotatably mounted ball engaging an inner surface of said outer ball housing under the force of said spring to resist said end play while permitting both misalignment of said drive and driven shafts and vertical sliding of said shank in said bore,

said universal connecting means being operative for maintaining the velocity of the driven shaft substantially constant when driven through said universal connecting means by said drive shaft independent of said drive shaft being axially aligned with said driven shaft during rotation thereof;

(d) a resurfacing tool mounting shaff secured to, forming an aligned extension of and driven by said driven shaft at said constant velocity;

(e) a resurfacing cutting tool removably secured to said tool-mounting shaft; and

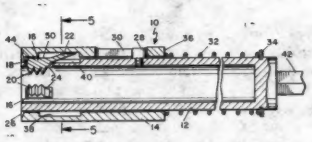
(f) a guide rod threadably secured to, forming an aligned extension of and extending outwardly from said tool-mounting shaft and adapted to enter and move axially in a selected said valve seat guide hole in a free sliding fit to bring said resurfacing tool in engagement with the corresponding valve seat for resurfacing thereof at said constant velocity.

4,630,978

THREAD CHASING TOOL

Terry L. Keiser, 2148 Euclid Ave., El Cajon, Calif. 92021, and Charles L. Guinnip, Chula Vista, Calif., assignors to Terry L. Keiser and Grant Y. Keiser, both of El Cajon, Calif.

Filed Oct. 3, 1985, Ser. No. 783,775
Int. Cl.[4] B23G 5/04
U.S. Cl. 408—159 9 Claims



1. A thread chasing tool, comprising:

inner and outer relatively slidable cylindrical sleeve members;

the inner sleeve member having a through bore and a series of spaced slots around its periphery adjacent one end of the tool;

a plurality of separate die elements rockably and releasably mounted between the opposed inner and outer surfaces of said outer and inner sleeve members adjacent said one end of the tool;

each die element comprising a head portion and a tail portion, the head and tail portions each having an outwardly directed cam surface for engagement with the inner surface of the outer sleeve member, the cam surfaces being angled relative to one another, the head portion having inwardly facing thread cutting teeth each die element having its head portion aligned with a respective one of said slots; and

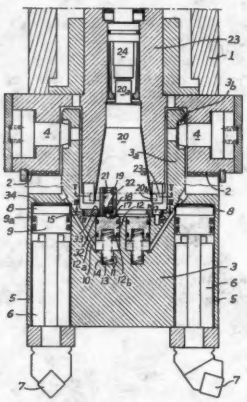
the outer cam surfaces on said die elements and the opposing inner surface of said outer sleeve member comprising cooperating means for urging said die elements back and forth between an expanded position in which said head portion is expanded out of said slots and a contracted, thread engaging position in which said head portion projects partially through said slots so that said thread cutting teeth project inwardly into the central bore of said inner sleeve member to engage a threaded member inserted in said one end of said inner sleeve member in response to relative sliding movement of said sleeve member in opposite directions.

4,630,979

CARTRIDGE TOOL LOCKING AND UNLOCKING DEVICE FOR TOOLHOLDERS

Jean-Pierre Roux, Saint Etienne, France, assignor to Berthiez-Saint-Etienne, Saint Etienne, France

Filed May 17, 1985, Ser. No. 735,044
Claims priority, application France, May 17, 1984, 84 07671
Int. Cl.[4] B23B *31/26, 31/30*
U.S. Cl. 409—232 8 Claims



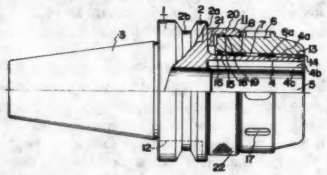
1. Device for locking and unlocking tool cartridges in a lathe or vertical boring machine toolholder mounted on a ram of a machine tool, wherein said cartridges are inserted into hollow compartments of the toolholder, said compartments comprising top parts that include first plungers for actuating locking and unlocking of said cartridges, said device comprising transmission means linked to control means and mounted to slide axially in a rotating block of said ram, said transmission means including a pin operable to selectively actuate any of several second plungers slidably mounted in one of several hydraulic cylinders arranged in the toolholder and connected via a duct to a hydraulic chamber provided in said top parts of said tool cartridge compartments, said chamber containing a fluid which acts upon one of said first plungers actuating the locking and unlocking of the tool cartridges.

4,630,980

CHUCK ASSEMBLY FOR A MACHINE TOOL

Haruaki Kubo, Osaka, Japan, assignor to Dai Showa Seiki Kabushiki Kaisha, Osaka, Japan

Filed Apr. 12, 1985, Ser. No. 722,819
Claims priority, application Japan, Jun. 29, 1984, 59-99419[U]
Int. Cl.[4] B23B *31/04*
U.S. Cl. 409—234 9 Claims



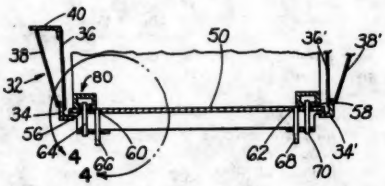
1. A chuck assembly for use in a machine tool for holding a tool element, which chuck assembly comprises a chuck body having a sleeve integrally formed therewith so as to protrude in one direction in alignment with the axis of rotation of the chuck assembly, said sleeve having a support bore defined therein for the receipt and support of the tool element, said sleeve also having its outer peripheral tapering surface in one direction away from the chuck body; a circumferentially extending, radially inwardly recessed engagement groove for engagement with a manipulator arm for the replacement of the chuck assembly with another chuck assembly defined in said chuck body; a fastening nut having its inner peripheral surface tapering in complementary relation to the tapered outer peripheral surface of the sleeve and rotatably mounted on said sleeve; a male screw thread provided on an outer peripheral surface of said fastening nut; a plurality of roll bearings interposed between the outer peripheral surface of the sleeve and the inner peripheral surface of the fastening nut thereby permitting the fastening nut to be helically rotated relative to the sleeve about the axis of rotation of the chuck assembly while moving axially of the sleeve; and a reinforcing nut having a cylindrical barrel, a contact flange extending inwardly in the radial direction from one end of said cylindrical barrel, and a female screw thread provided on an inner peripheral surface of the cylindrical barrel which is in rotatable engagement with the male screw thread provided on the outer peripheral surface of the fastening nut, the reinforcing nut is threadingly mounted on the fastening nut and the contact flange is adapted to be engaged under pressure with an annular end face of the chuck body by rotating the reinforcing nut when said fastening nut is fastened.

4,630,981

APPARATUS FOR RESTRAINING CONTAINERS IN A RAILWAY CAR

Richard J. Mandrell, St. Charles, Mo., assignor to ACF Industries, Incorporated, Earth City, Mo.

Filed Aug. 24, 1984, Ser. No. 643,983
Int. Cl.[4] B60P *1/64*
U.S. Cl. 410—91 1 Claim



1. Apparatus for securing any one of four standard size containers in a railway car so as to substantially restrain the container against lateral and longitudinal movement with respect to the railway car, said containers having one of two standard lengths including a longest and a shorter length and one of two standard widths including a widest and a narrower width, said car having a bottom on which said container rests, a side wall extending above said bottom at each side thereof, said side walls being spaced apart only somewhat wider than the width of said standard widths, and an end wall at each end of said car, said end walls extending above said car bottom and being spaced apart from one another a distance only somewhat greater than the longest of said standard lengths, said container having a container foot at each corner thereof, each corner foot having an opening in the bottom face thereof, a plurality of pins carried by said car bottom and being spaced for reception in said corner feet openings of said corner feet of certain of said containers, a first standard size container of said longest length and said widest width being restrained against lateral and longitudinal movements by said side walls and said end walls, a second standard container of said longest length and said narrower width being restrained against longitudinal movement by said end walls and being restrained against lateral movement by a first set of said pins, a third standard size

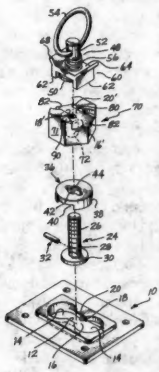
container of said shorter length and said wider width receiving a second set of said pins within said corner openings thereby to restrain said third container against longitudinal movement with respect to said car, said third container being restrained against lateral movewment by said side walls, and with a fourth standard size container of said shortest length and narrowest width receiving a third set of said pins within the corner foot openings thereby to restrain said fourth container against both longitudinal and lateral shifting with respect to said car, said pins being resiliently depressable into said car bottom upon a container bearing thereon such that when one of said four standard size containers is loaded onto said car, its respective set of pins is spaced for reception in the openings of the bottom feet castings thereof, and such that the remaining pins in engagement with the bottom of the one standard size container are resiliently depressed into the car bottom.

4,630,982

CARGO TIE-DOWN SYSTEM

James A. Fenner, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 27, 1985, Ser. No. 802,868
Int. Cl.[4] B61D *45/00*; F16B *37/00, 39/00*
U.S. Cl. 410—102 **10 Claims**



1. Apparatus for releasably securing two or more devices to a structure at a single location, said apparatus comprising the combination of:

a receptacle mounted on the structure and having a first socket;

a stud having a threaded shaft portion for engaging a first device, and a head portion dimensioned to be received into the socket with said shaft portion projecting from the socket;

retaining means for releasably securing said head portion in the socket;

a nut having a hole with threads for threadedly engaging said shaft portion to secure said first device thereto, and a second socket that is substantially the same as the first socket to enable it to receive substantially any stud that is receivable by the first socket; and

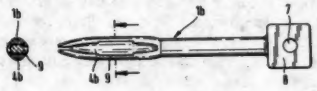
a second stud having a head portion dimensioned to be received into the second socket, and means for engaging a second device.

4,630,983

EXPANSION PIN

Artur Fischer, Weinhalde 34, 7244 Waldachtal 3/Tumlingen, Fed. Rep. of Germany

Filed Dec. 6, 1984, Ser. No. 679,020
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1983, 3345331; Feb. 8, 1984, 3404306
Int. Cl.[4] F16B *21/08*
U.S. Cl. 411—15 **11 Claims**



1. An expansion pin for securing articles to a support structure, comprising:

a shank having an apertured region, two ends, an outer surface, and an expandable portion at one end;

means for securing the articles by the expansion pin at said other end of said shank; and

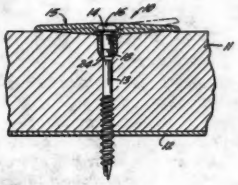
a deformable expansion element oriented in said apertured region so as to thicken said shank, said expansion element having a length and having guide ribs at least over a part of said length that rest against said outer surface of said shank.

4,630,984

ASSEMBLY FOR FASTENING A LAYER OF COMPRESSIBLE MATERIAL TO A RIGID MEMBER

Ernest W. Reinwall, McHenry, and John Spibey, Rockford, both of Ill., assignors to Elco Industries, Inc., Rockford, Ill.

Filed Jan. 27, 1984, Ser. No. 574,570
Int. Cl.[4] F16B *43/00*
U.S. Cl. 411—368 **2 Claims**



1. An assembly for fastening together a stack of flat generally horizontal members including a layer of compressible material and a rigid member underlying the layer, said assembly comprising a disk made of a resiliently flexible material and having a central hole, an annular flange formed integrally with and depending from the underside of said disk adjacent the periphery thereof and having a downwardly facing surface defining a contact pad engageable with said stack to apply downward pressure thereto around an annular sealing band, an elongated fastener projecting through said hole and adapted to project down through said layer, the lower end portion of said fastener being threaded to be driven into said rigid member, a head formed on the upper end of said fastener to engage the upper side of said disk, an annular hub formed integrally with said disk and projecting downwardly from the underside thereof, said hub being coaxial with said hole to surround the upper end portion of said fastener and being of sufficient length to project downwardly a substantial distance below said disk and into said layer, the upper end portion of said hub being joined continuously to said disk around the entire circumference of the hub, the lower end portion of said hub being formed with downwardly opening longitudinally extending slots to define angularly spaced fingers which flex to enable the

hub to expand, the lower ends of said fingers being located in a substantially horizontal plane, and a collar formed on said fastener above said threaded lower end portion and having an upper end providing an upwardly facing shoulder spaced downwardly from the underside of said head, said collar having a side surface which tapers downwardly from the periphery of said shoulder to cam said fingers apart and permit said collar to pass through said hub as said fastener is inserted through said hole, said shoulder being located completely below all portions of said disk so as to be located within said layer, said shoulder being located in a substantially horizontal plane and being spaced from said head a distance generally equal to the length of said hub to squarely engage the lower ends of said fingers and to hold the disk adjacent said head, the substantially horizontal shoulder and the lower ends of said fingers constituting means configured to keep the disk adjacent the head of the fastener regardless of whether the fastener rotates in either direction relative to the disk after the fastener is inserted through said hole in said hub.

4,630,985

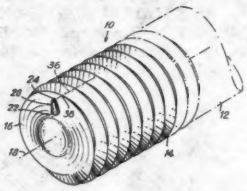
SELF ALIGNING SCREW

Leon Simons, 303 E. 57th St., Apt. 47-E, New York, N.Y. 10022

Filed Jan. 12, 1984, Ser. No. 570,104

Int. Cl.[4] F16B *25/00*

U.S. Cl. 411—386 **9 Claims**



1. A self-aligning screw for use in a pre-threaded opening, the self-aligning screw comprising:

a screw body of extended length, the screw body having a longitudinal axis in the body length direction;

a screw thread spirally encircling at least a portion of the body, the screw thread adapted to engage a thread in a pre-threaded opening;

a leading end on the screw body, the leading end extending in the lengthwise direction of the body and being adapted to precede the screw body into the pre-threaded opening; and

a sole projection extending from the leading end of the screw body in a direction generally transverse to the axis, the projection being joined at a first end to the leading end of the screw body, the other end of the projection being free, the projection being positioned and contoured at the free end for nesting within the groove between adjacent threads of the pre-threaded opening when the screw thread and the thread of the pre-threaded opening are engaged, the projection comprising a conical segment having a rounded end, the projection being so positioned on the screw body relative to the start of the screw thread that, when the screw enters the pre-threaded opening, contact of the projection at any point along the outward-facing surface of the thread in the pre-threaded opening will serve to guide the screw thread into mating engagement with the thread of the pre-threaded opening as the screw and the pre-threaded opening are turned relative to one another.

4,630,986

BALE HANDLER

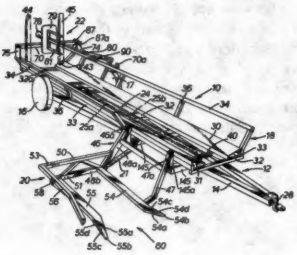
Robert W. A. Taylor, Island Rd., Cohuna, Victoria, Australia

Filed Feb. 28, 1985, Ser. No. 706,988

Claims priority, application Australia, Mar. 29, 1984, PG4317; Aug. 13, 1984, PG6532

Int. Cl.[4] A01D *87/12*

U.S. Cl. 414—24.6 **16 Claims**



1. A bale handler comprising:

a body with a pair of ground wheels rotatable substantially on a common axis;

a bed for supporting two or more round bales end-to-end;

pivot means for rotatably supporting said bed on said body for rearward tilting movement about a horizontal axis to unload the bales as a vertical stack;

means to effect said rearward tilting movement of said bed; and

secondary support means upstanding from the rear end of the bed and extending substantially normally therefrom, for abutting the rearmost bale thereon and supporting the bales as the bed is tilted, which secondary support means terminates at an outer tip and is shaped to define heel means substantially nearer said tip than to said bed;

wherein, by means of said rearward tilting movement, said bed may be brought from a fully lowered position to an unloading/reloading position past vertical at which the stack remains stable and said heel means of the secondary support means contacts the ground and bears the weight of the bed and bales thereon;

and wherein said horizontal axis is located close behind the vertical plane containing said common axis of the ground wheels and is displaced from said rear end of the bed in a direction parallel to the bed so that the portion of said bed between said support means and said axis which moves rearwardly as the bed is lowered from said position during the reloading is sufficient to stabilize the stack.

10. A bale handler comprising:

a vehicle which defines a bed for supporting bales;

a loading cradle moveably mounted to the vehicle for picking up bales form the ground on-the-run; and

means for moving said cradle to transfer a picked up bale onto the bed;

wherein the loading cradle comprises:

a pair of laterally spaced support members which project in the direction of travel of the vehicle for passing under a bale to lift and support it and which define at their forward ends opposed edges which, in a horizontal plane, are inclined to the direction of traval so as to be mutually forwardly divergent, said inclined edge which is further from said bed extending, in said direction of travel, further rearwardly than the other inclined edge, whereby to facilitate centering a bale approached off-centre, each support member further being tapered at its forward end, in both vertical and horizontal planes, to facilitate engagement under a bale; and

a pair of restraining members positioned to restrain the bale respectively to it s rear and outer sides, relative to the

vehicle, as it is lifted and supported by said support member.

4,630,987

PERIPHERAL AUXILIARY SYSTEM FOR THE AUTOMATIC FEEDING AND UNLOADING OF A STAMPING/NIBBLING MACHINE

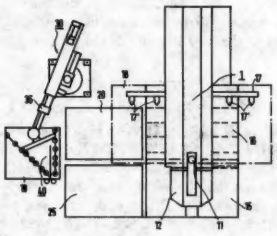
Hans Poersch, and Gustav Stark, both of Nuremberg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin/-Munich, Fed. Rep. of Germany

Filed Aug. 8, 1984, Ser. No. 638,820

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1983, 3329902

Int. Cl.[4] B65G 60/00

U.S. Cl. 414—32 10 Claims



1. A peripheral auxiliary system for automatic feeding and unloading of a stamping/nibbling machine, comprising:

an industrial robot having a gripping mechanism for picking up blanks and stamped parts, the gripping mechnaism comprising

a V-shaped frame which is shaped to carry a blank along an edge and a diagonal and a means for adhering to blanks, stamped parts and stamped-out blanks comprising a plurality of suction cups and connections to a vacuum line, said suction cups being classified in groups and being connectable in groups to the vacuum line, and said frame having an apex;

an extendable arm mounted to the frame at said apex; means for transporting and delivering stamped parts and stamped-out blanks; and

means for stacking stamped-out blanks in piles, said stacking means having a delivery surface which can be swivelled and displaced in one operation.

4,630,988

BULK MATERIAL HOPPER

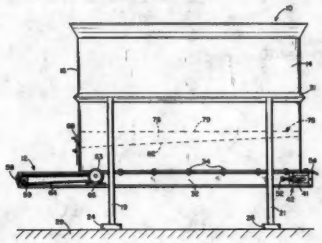
Donald D. LaRue, Ionia, Iowa, assignor to Hydrotile Machinery Company, Nashua, Iowa

Filed Jul. 11, 1984, Ser. No. 629,794

Int. Cl.[4] B65G 65/00

U.S. Cl. 414—327 15 Claims

6. A material handling apparatus comprising: a box having walls including a bottom wall surrounding a chamber for accommodating material, one of said walls having a material discharge opening adjacent said bottom wall, said bottom wall extended through said material discharge opening, conveyor means located on said bottom wall in said chamber operable to move material from the chamber, through said material discharge opening, means for operating the conveyor means, and divider means located in the chamber above the conveyor means providing openings on opposite sides thereof for facilitating the flow of material in the chamber to the conveyor means, said divider means having a pair of divider side walls, each divider side wall terminating in an outer lower edge, each outer lower edge extended downwardly and outwardly in the direction of movement of the conveyor means, said divider means increasing in width in the direction of movement of the conveyor means whereby the openings adjacent opposite sides of the divider means decrease in the direction of movement of the conveyor means and the vertical distance between the lower edges of the divider side walls decreases in the direction



of movement of the conveyor means to facilitate the flow of material to the conveyor means and minimize bridging and packing of material in the chamber.

4,630,989

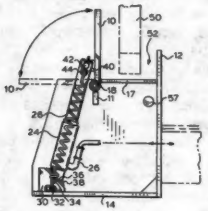
TRUCK RESTRAINT SYSTEM

Jack E. Davey, Brampton, Canada, assignor to Blue Giant Equipment of Canada Ltd., Brampton, Canada

Filed Sep. 30, 1985, Ser. No. 782,290

Int. Cl.[4] B65G 67/02, 69/00

U.S. Cl. 414—401 11 Claims



1. A device for restraining a vehicle, such as a truck or transport trailer, at a loading dock comprising a frame having a vertical securing face and a lower horizontal bearing face,

a pivotal bar having one end pivotally secured to said frame above and intermediate the length of said lower bearing securing face and said vertical securing face,

said pivotal bar being movable from a generally horizontal vehicle release position, with said bar generally parallel to said lower horizontal bearing face, to a vehicle restraining position with said bar generally perpendicular to said lower horizontal bearing face,

a hydraulic cylinder pivotally secured adjacent the forward end of said lower horizontal bearing face and pivotally secured to said bar to be angled rearwardly towards said vertical securing face,

said hydraulic cylinder being pivotally secured to arms secured to and extending below said bar beyond said pivot securement of said bar to said frame,

said hydraulic cylinder when actuated to extend causing said bar to move from said horizontal vehicle release position to said vehicle restraint position,

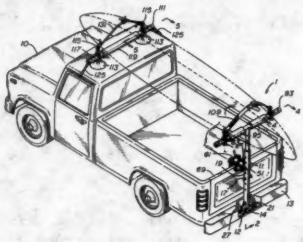
the pivot of said bar being spaced from the vertical securing face, at least about 9 inches to accommodate therebetween a vehicle IC bar.

4,630,990

DEVICE AND METHOD FOR LOADING AND TRANSPORTING ELONGATE OBJECTS ON THE TOPS OF VEHICLES

Montague Whiting, Box 6109 SFA, Nacogdoches, Tex. 75962

Filed Sep. 3, 1985, Ser. No. 772,154
Int. Cl.[4] B60P 3/10
U.S. Cl. 414—462 10 Claims



1. A device for loading and transporting elongate objects on a vehicle, said vehicle including means adjacent the front end thereof for supporting one end of said elongate objects, comprising:

a lower hollow tubular member adapted for connection at its lower end in an upright orientation to said vehicle adjacent the rear end thereof;

a first upper member having a lower portion adapted to be rotatably supported within said lower hollow tubular member, said first upper member having an upper end;

a second upper member of elongate configuration mounted at substantially its mid-portion on the upper end of said first upper member and being transversely disposed with respect thereto, said second upper member having an upper bearing surface for supporting the other ends of said elongate objects;

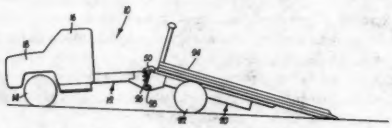
a clamping means for providing support and stability to the upper portion of said lower hollow tubular member, wherein said clamping means comprises a U-shaped clamp disposed on said upper portion of said hollow tubular member, said clamp having a curved portion disposed around and attached to said lower hollow tubular member and threaded leg portions extending perpendicularly to said lower hollow tubular member, and a pair of downwardly extending plates disposed on said threaded leg portions of said U-shaped clamp for receiving the tailgate of said vehicle between said plates.

4,630,991

TRUCK HAVING TILTABLE FRONT AND REAR FRAMES

Donald R. Landoll; Kyle D. Swart, both of Marysville, Kans., and Joseph B. Morris, Lincoln, Nebr., assignors to Landoll Corporation, Marysville, Kans.

Filed Jan. 7, 1985, Ser. No. 689,386
Int. Cl.[4] B60P 1/32
U.S. Cl. 414—478 5 Claims



1. In a vehicular chassis having a first frame with an end, a second frame with an end proximal to said first frame end, and an articulation interconnecting the ends of respective frames for up and down tilting movement of both frames about a normally horizontal axis, a three-bar linkage assembly to effect tilting of said first frame and said second frame, said linkage assembly comprising:

a first rigid bar means having a first end portion pivotally coupled to said first frame;

a second extensible bar means having a first end portion pivotally coupled to said first frame at a position spaced from said first bar means; and

a third rigid bar means having a first portion, a second portion and a third portion,

said first bar means having a second end portion pivotally coupled to said third bar means first portion,

said second bar means having a second end portion pivotally coupled to said third bar means second portion,

said third bar means third portion being pivotally coupled to said second frame at a fixed location on the latter,

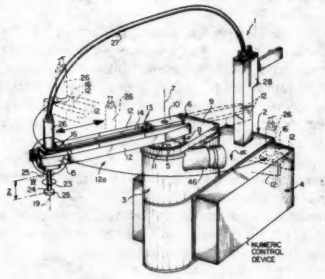
said second bar means being selectively extensible and retractable for pivoting said third bar means relative to said second frame and for simultaneously swinging said first bar means to thereby tilt said first frame and said second frame.

4,630,992

MACHINE FOR EFFECTING THE TRANSFER OF OBJECTS IN THE SPACE BETWEEN POSITIONS HAVING PREDETERMINED CO-ORDINATES

Luigi Gilli, Luserna San Giovanni, and Franco Sartorio, Turin, both of Italy, assignors to Prima Progetti S.p.A., Turin, Italy

Filed Sep. 30, 1983, Ser. No. 537,483
Claims priority, application Italy, Oct. 1, 1982, 68155 A/82; Jul. 11, 1983, 67750 A/83
Int. Cl.[4] B25J 9/00, 17/02
U.S. Cl. 414—744 R 9 Claims



1. A machine for transferring objects in space between positions having predetermined co-ordinates, the machine comprising

a fixed tubular support member extending along a first axis;

a tubular carousel coaxial with said tubular support member and rotatably supported thereby;

a support head connected to said carousel for rotation therewith about said first axis;

sliding means connected to said support head to slide relative to said support head in a direction substantially perpendicular to said first axis;

an object-holding head supported by said sliding means so as to be rotatable relative thereto about a second axis substantially parallel to said first axis;

a first and a second shaft coaxial with each other and with said carousel and supported by said carousel so as to be rotatable relative to each other and to said carousel;

drive means carried by said fixed tubular member to selectively rotate said first and second shafts and said carousel about said first axis; and

first and second transmission means of the type adapted for transmission of rotation between members mounted for

rotation about respective axes parallel to each other, said first and second transmission means being coupled with said first and said second shafts respectively, and both said first and second transmission means coupled with said object-holding head.

4,630,993

AXIAL-FLOW FAN

Carl E. Jensen, Naestved, Denmark, assignor to Nordisk Ventilator Co., Naestved, Denmark

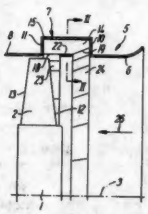
PCT No. PCT/DK84/00070, § 371 Date Mar. 22, 1985, § 102(e) Date Mar. 22, 1985, PCT Pub. No. WO85/00640, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 23, 1984, Ser. No. 717,265

Claims priority, application Denmark, Jul. 28, 1983, 3458/83

Int. Cl.[4] F04D *5/00*

U.S. Cl. 415—53 R 9 Claims



1. An axial flow fan comprising; a rotor adapted to rotate in a predetermined direction about an axis and having a hub and a plurality of rotor blades each of which extends radially outwards from the hub and terminates in a blade tip, each rotor blade having a leading and a trailing edge;

a casing coaxially surrounding the rotor and including an inlet section having a downstream end located upstream of the rotor blades, an outlet section of substantially the same diameter as the inlet section and having an upstream end located in a plane extending normally to the rotor axis intermediate the leading and trailing edges of the rotor blades, and an intermediate section connecting the inlet and outlet sections and having a larger diameter than those sections, said intermediate section being defined by a peripheral wall and two end walls and being attached to the downstream end of the inlet section and the upstream end of the outlet section, respectively, whereby said peripheral and end walls define an annular chamber partly overlapping the blade tips of the rotor;

a plurality of guide vanes angularly spaced within said annular chamber, thereby dividing the chamber into a plurality of compartments distributed along the circumference thereof, each guide vane being secured to the walls of the annular chamber and extending from one end wall to the opposite end wall thereof and having a radially innermost edge zone which is oriented into the predetermined direction of rotation of the rotor and includes an angle of between 65° and 40° with an associate radius connecting the inner edge of the vane with the rotor axis.

4,630,994

APPARATUS FOR AXIALLY AND CIRCUMFERENTIALLY LOCKING STATIONARY CASING COMPONENTS OF TURBOMACHINES

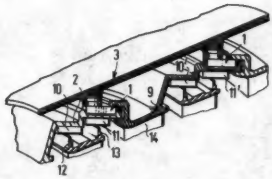
Helmut Grõss, Esterhofen, Fed. Rep. of Germany, assignor to Motoren- und Turbinen Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 7, 1984, Ser. No. 648,801

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1983, 3333436

Int. Cl.[4] F01D *1/02*

U.S. Cl. 415—190 18 Claims



1. A device for axially and circumferentially locking two stationary components of a turbomachine, each of which components is at least part of a ring and wherein said components are concentrically engaged along opposed surfaces, said device comprising a locking member including a smooth, cylindrical disc portion and an axially projecting angular segment on said disc portion forming an axial step thereon, said angular segment being substantially semi-cylindrical and having an outer periphery continuous with the outer periphery of said disc portion, the components being provided with axially aligned intercommunicating hollows, the hollow of one of said components being substantially cylindrical and the hollow of the other of said components being of step form with a cylindrical portion coaxial and of the same diameter as the hollow of said one component and a substantially semi-cylindrical portion extending axially of the cylindrical portion and having a lateral opening, said locking member being engaged in the hollows of the stationary components in a locking position in which said disc portion extends in part in the hollow of said component and in part in the cylindrical portion of the hollow of said other component and said angular segment extends into said semi-cylindrical portion of said other component whereby said components are prevented from undergoing relative axial and circumferential movement, said locking member being turnable in said hollows to a release position in which said stationary components are unlocked, said cylindrical disc portion being rotatable in the hollows of both said components for movement of the locking member between the locking and release position, said angular segment being positioned and formed in relation to said semi-cylindrical portion of the hollow in said other component to emerge from said hollow in said other component through said lateral opening when said locking member rotates from the locked position to the release position, said locking member in said release position being removable from said hollow in said one component by axial displacement of the locking member relative to said components whereafter said locking member can be separated from the components.

4,630,995

FLUID FLOW ENGINE, ESPECIALLY POWER ENGINE ACTED UPON BY GAS

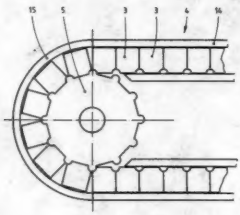
Wolfgang Betz, Gauting, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union Muenchen GmbH, Fed. Rep. of Germany

Filed Aug. 23, 1984, Ser. No. 643,434

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1983, 3347775

Int. Cl.[4] F01D *23/00*

U.S. Cl. 416—7 8 Claims



1. A fluid flow engine for converting flow energy into useful energy, comprising a plurality of force transmitting means absorbing energy from said fluid flow and which are devoid of any common driving element and arranged to be displaceable along an endless closed path in guide means having straight and circular parts for straight and reversing drive direction, respectively, said path being perpendicular to the main direction of fluid flow, shaft means responsive to the displacement of said force transmitting means, wherein said force transmitting means are displaceable along said path in response to the absorption of energy to cause rotation of said shaft means.

4,630,996

WINDMILL

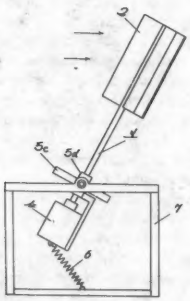
Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed Sep. 10, 1984, Ser. No. 649,067

Claims priority, application Japan, Sep. 22, 1983, 58-174191

Int. Cl.[4] F03D *7/06, 11/04*

U.S. Cl. 416—16 1 Claim



1. In a vertical-type windmill consisting essentially of
a tower structure;
a pivot;
a strut rotatably supported on the upper portion of the tower structure by the pivot so that the strut is capable of inclining around the pivot when the velocity of the wind exceeds a prescribed level;
a vertically disposed impeller including a plurality of fliers, said impeller being carried on said strut;
and a dynamo installed on the lower portion of the strut and engaged with the lower part of the tower structure with a spring, said dynamo functioning as a counterweight,
the improvement comprising:
said pivot constituting a gyrocompass-type bearing having a pedestal supported on the upper portion of the tower structure, the strut being rotatably supported on the pedestal,
whereby the strut is capable of instantly inclining in the direction of the wind when the velocity of the wind exceeds a prescribed level.

4,630,997

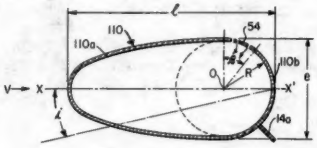
APPARATUS FOR PRODUCING A FORCE WHEN IN A MOVING FLUID

Jacques Y. Cousteau, Monaco, Monaco; Lucien Malavard, Paris, and Bertrand Charrier, Meudon, both of France, assignors to Fondation Cousteau, Paris, France

Continuation-in-part of Ser. No. 324,624, Nov. 24, 1981, abandoned. This application May 4, 1984, Ser. No. 607,386

Int. Cl.[4] B63H *9/02*

U.S. Cl. 416—90 A 56 Claims



1. A device which is to be placed in a fluid moving in a first direction in order to produce a drive force in a second direction which is substantially transverse with respect to the first direction, wherein said device comprises an elongated body having in cross-section a rounded and symmetrical profile with respect to an axis of symmetry which defines with the first direction an angle of incidence in the second direction, said profile defining a rounded and elongated leading portion whose thickness increases from the front to the rear and a rounded trailing portion whose thickness decreases from the front to the rear, the maximum thickness of the profile being between 50 and 100% of its length in the direction defined by its axis of symmetry, the leading portion being longer than the trailing portion, the device also comprising means for sucking the fluid into the body in a suction area located on a first side of the profile on which said force is to be produced, at least on the trailing portion of the profile, and at least one flap which projects with respect to the body, said flap being located on the trailing portion of the profile, on a second side of the profile opposite to said first side.

4,630,998

APPARATUS FOR CONTROL OF COLLECTIVE AND CYCLIC PITCH OF THE BLADES OF A ROTOR

Jean-Luc Leman; Michel V. Russier, both of Aix-en-Provence, and Robert J. Suzzi, Marseilles, all of France, assignors to Aerospatiale Société Nationale Industrielle, Paris, France

Filed May 10, 1985, Ser. No. 732,767

Claims priority, application France, May 14, 1984, 84 07421

Int. Cl.[4] B64C *27/35, 27/605*

U.S. Cl. 416—134 A 7 Claims

1. Apparatus for controlling the collective pitch and cyclic pitch of blades of a rotor of a rotorcraft, the rotor craft having a main body and a housing rigidly connected to the main body, the rotor comprising a shaft extending out of the housing rotatably driven about a rotor rotation axis and rotor blades connected to the shaft, each rotor blade having a pitch, a control lever for controlling the pitch, and a respective pitch control rod connected to the control lever,

said apparatus comprising:

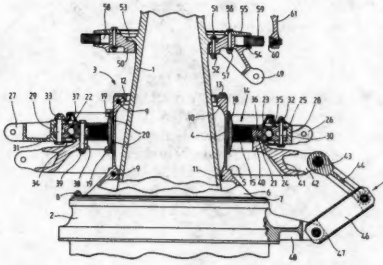
two annular plates coaxially mounted around said shaft, one of said plates being a turning plate and the other being a non-turning plate;

ball bearing means interconnecting said plates;

at least one lower linking member preventing rotation of said non-turning plate about said rotation axis connected to the housing and to the non-turning plate, said non-turning plate including articulating means for mounting said apparatus to be displacable in translation in the direction of said rotation axis and tiltable with respect to said rotation axis;

at least one upper linking member driving said turning plate in rotation with the shaft linked to the shaft and to said turning plate, the pitch control rod of each of the rotor blades being connected to said turning plate;

combined function collective pitch and cyclic pitch control member connected to said non-turning plate for displacing it along said shaft and for tilting it with respect to said rotation axis, said turning plate following the movement of said non-turning plate and transmitting these movements to the pitch control levers via the pitch control rods;



said articulating means including at least three deformable laminated assemblies spaced apart from one another and distributed about the shaft, each assembly comprising a stack of alternating dish-shaped elements of rigid material and layers of an elastic material allowing, by shear deformation of said elastic material, said plates to be tilted with respect to said rotation axis for controlling cyclic pitch, and a radially inner rigid armature and a radially outer rigid armature between which said stack is sandwiched, said inner armature being armated substantially in the form of an arc of a circle, the inner armatures of all said assemblies being assembled together forming a unitary radially inner ring slidingly mounted in the direction of said rotation axis, the outer armature of all said assemblies forming a crown supporting said ball bearing means.

4,630,999

AXIAL FAN

Jean H. De La Harpe, Transvaal, South Africa, assignor to James Howden & Company Limited, Glasgow, Scotland

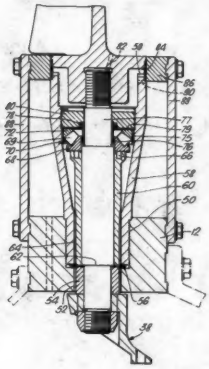
Filed Oct. 11, 1984, Ser. No. 659,639

Claims priority, application European Pat. Off., Oct. 14, 1983, 83306249.0

Int. Cl.[4] F04D *29/36*

U.S. Cl. 416—167 **8 Claims**

1. An axial flow fan comprising a hub, a plurality of bearings mounted on said hub in circumferentially spaced relationship, a blade spindle mounted on each bearing and extending radially relative to said hub, and each blade spindle being pivotable about its own axis in the associated bearing, a fan blade removably carried by each spindle for pivotal movement therewith, an operating mechanism for causing the pivotal movement thereof to give adjustment to the blade angle and, associated with each spindle, a replaceable cartridge, each replaceable cartridge comprising a tubular casing coaxially surrounding its associated spindle, a threaded inner end portion of said tubular casing removably threaded into the hub of the fan, a thrust bearing and at least one radial bearing axially spaced from said thrust bearing mounted wholly within each said tubular casing to take up axial and radial loads, respectively, between said spindle and casing, said thrust bearing and at least one radial bearing being mounted wholly within said casing, effective to be removable from the hub and shaft as the tubular casing is removed from the hub as a unit leaving the spindle mounted on the hub.



4,631,000

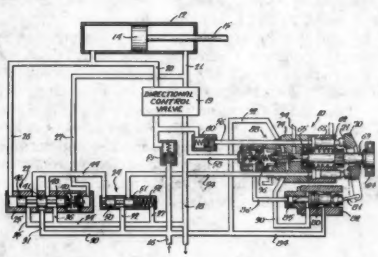
VARIABLE DISPLACEMENT HYDRAULIC PRESSURE INTENSIFIER

Wesley A. Burandt, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 16, 1984, Ser. No. 631,981

Int. Cl.[4] F04B *17/00, 35/00*

U.S. Cl. 417—225 **22 Claims**



1. A hydraulic pressure intensifier comprising, a motor-pump unit having a rotatable cylinder block with cylinders each of which has a movable piston therein and a wobbler for controlling the stroke of the pistons and which functions simultaneously as both a pump and a motor by means of porting to said cylinders including a supply pressure port, an intensified pressure port and a return pressure port, means for supplying fluid under pressure to the supply pressure port at all times during operation with an increase in fluid pressure at the intensified pressure port, the improvement characterized by means for varying the position of the wobbler to vary the stroke of the pistons and thereby vary the speed of rotation of the cylinder block for a given rate of fluid flow to the unit with the

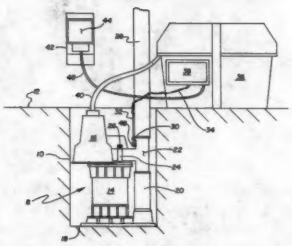
speed of the cylinder block being solely dependent upon the stroke of the pistons, and means operable when the rotatable cylinder block of the motor-pump unit is operating at a speed limit for activating said wobbler position varying means to prevent the speed of the cylinder block from going beyond the speed limit while the pressure is maintained at the intensified pressure port.

4,631,001

T-FITTING WITH ONE WAY VALVE AND WATER LEVEL SENSOR FOR A SUMP APPARATUS

David W. Keech, Bryan, Ohio, assignor to The Scott & Fetzer Co., Fort Wayne, Ind.

Filed Aug. 9, 1985, Ser. No. 764,868
Int. Cl.[4] F04B *41/06, 49/00*
U.S. Cl. 417—3 **27 Claims**



1. In a sump system having a primary and a secondary backup pump, an apparatus comprising:

a T-fitting fluidly connecting the primary pump and secondary pump outlets to a common exhaust, said T-fitting having cylindrically shaped connecting ends, said secondary pump cylindrically shaped connecting end substantially horizontally disposed,

a fastening means on the extetior surface of said T-fitting for fastening thereon a water level sensor means for electrically sensing the water level to in turn energize the secondary pump and

a one-way valve within said secondary pump cylindrically shaped connecting end.

7. In a sump system having a primary and a secondary backup pump, an article comprising:

a T-fitting having a primary pump connecting end and a secondary pump connecting end, said T-fitting fluidly connecting the primary pump and the secondary pump outlets to a common exhaust, a one-way valve positioned within said T-fitting in the secondary pump connecting end so as to be substantially horizontally disposed and a slot on said secondary pump connecting end starting at the outermost radial periphery and extending axially towards said T-fitting, whereby said slot makes the outermost periphery of said secondary pump connecting end radially flexible.

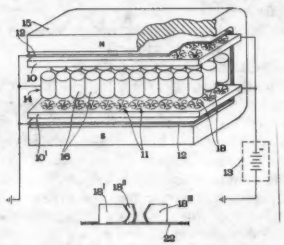
4,631,002

ION PUMP

Marco Pierini, Genoa, Italy, assignor to Varian S.p.A., Turin, Italy

Filed Aug. 22, 1983, Ser. No. 525,468
Claims priority, application Italy, Sep. 14, 1982, 68093 A/82
Int. Cl.[4] F04F *11/00*
U.S. Cl. 417—49 **4 Claims**

1. A sputter ion pump comprising a pumping element arranged between spaced pole pieces of a magnet, said pumping element including two spaced cathodes of getter material and an anode having a plurality of hollow cylindrical cells disposed between said cathodes, characterized in that each of said cathodes has a plurality of areas composed of a plurality of inwardly extending blades, each said area of each cathode being located adjacent an anode cell and being coaxial with a corresponding area in the other cathode, said inwardly extending



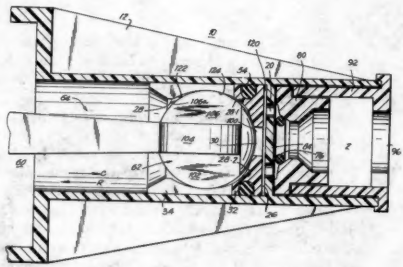
blades of each cathode area being disposed radially relative to the axis of its adjacent anode cell and extending parallel to the axis of its adjacent anode cell.

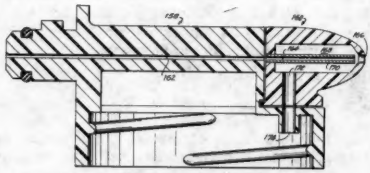
4,631,003

FLUID MEDIUM COMPRESSOR AND USER APPARATUS

Edward B. Chamberlin, Short Hills; Edward M. Brown, Livingston, and Edward J. Towns, Morristown, all of N.J., assignors to Spray-All, Inc., Millburn, N.J.

Filed Aug. 15, 1983, Ser. No. 523,127
Int. Cl.[4] F04F *5/00;* F04B *7/00;* B05B *9/04*
U.S. Cl. 417—151 **30 Claims**





1. Apparatus for compressing a fluid medium comprising:

a housing having fluid medium inlet and outlet ports;

a resilient, hollow piston supported for movement in said housing, said piston defining a fluid compression surface and having a fluid flow passage extending through said piston and said fluid compression surface;

a drive source having an output member displaced in first and second respectively opposite strokes, and

a piston rod having an end portion insertable within said piston and capable of limited translation with respect

thereto, said piston rod interconnecting said piston and said output member for displacing said piston in said first stroke while translated with respect to said piston so as to preclude flow communication between said passage and said inlet port and for displacing said piston in said second stroke while translated with respect to said piston so as to place said passage in flow communication with said inlet port.

4,631,004

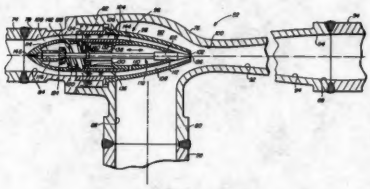
JET PUMP HAVING PRESSURE RESPONSIVE MOTIVE FLUID CONTROL VALVE

Edward A. Mock, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 397,749, Jul. 13, 1982, Pat. No. 4,573,323. This application Sep. 23, 1985, Ser. No. 758,193

Int. Cl.⁴ F04F *5/48*

U.S. Cl. 417—189 **8 Claims**



1. A fluid pressure responsive variable jet pump comprising a housing defining an inlet, an outlet, and a high pressure inlet; a nozzle assembly in association with said high pressure inlet for forming a jet of fluid directed toward said outlet to entrain fluid from said inlet; and valve means for comparing fluid pressure at said high pressure inlet with a substantially constant reference fluid pressure and controlling fluid flow through said nozzle assembly in response to said comparison;

said housing defining a chamber communicating with said inlet, a convergent section of said chamber leading to a throat section, and a divergent diffuser section leading from said throat section to said outlet, said nozzle assembly being disposed to discharge said jet of fluid across at least a portion of said chamber toward said outlet;

said valve means including a valve member movable to control said fluid flow through said nozzle assembly, means defining a variable-volume resilient chamber operatively coupled with said valve member, and resilient means for biasing said valve member in a first direction;

said variable-volume chamber defining means including a resilient annular bellows member; and

said chamber defining means including a pair of said resilient annular bellows members arranged coannularly.

4,631,005

INPUT TORQUE CONTROL DEVICE

Gerald K. Warren, Rosenweg 15,, D-6382 Friedrichsdort, and Raffaele Sandroni, Gartenfeldstrasse 40E, D-6380 Bad Homburg, both of Fed. Rep. of Germany

Filed Oct. 11, 1985, Ser. No. 786,791

Claims priority, application European Pat. Off., Aug. 17, 1985, 85110318.4

Int. Cl.⁴ F04B *1/26*

U.S. Cl. 417—218 **13 Claims**

1. Input torque control device for adjusting the input torque acting on a hydraulic variable displacement pump comprising:

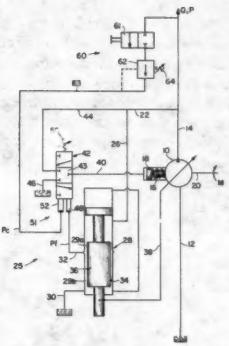
means for changing said pump displacement including hydraulic servo motor means;

control valve means including a spool having a first and a second side which are opposed;

a first control piston means acting on said first side of said spool, an adjustable return means including spring means acting onto said second side of said spool, said control valve means also having a pressure supply port, an output control port and a tank port, said output control port being connected to said servo motor means;

a torque sensor delivering a hydraulic feedback pressure signal indicative of input torque acting onto said variable displacement pump;

said feedback pressure signal acting upon said first control piston means against the action of said return means to



move said spool of said control valve means when said pump displacement is being changed;

a remote control device adapted to deliver a further pressure signal showing at least one selective pressure level;

a second control piston means adapted to receive said further pressure signal and being arranged to act onto said first side of said spool against said return means so that said spool is moved to a position indicative of one desired input torque acting onto said variable displacement pump corresponding to said one selective pressure level.

4,631,006

COMPACT VACUUM PUMP

Gary P. Murray, Montpelier, Ohio, assignor to Robinair Division, Montpelier, Ohio

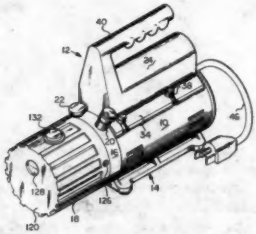
Filed Feb. 19, 1985, Ser. No. 703,185

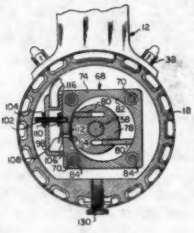
Int. Cl.⁴ F04C *25/02, 29/08*

U.S. Cl. 417—234 **2 Claims**

1. A vacuum pump characterized by its light weight and concise configuration comprising, in combination, an electric motor having a substantially cylindrical casing having first and second open ends and upper and lower regions, a base affixed to said casing lower region, a one-piece handle assembly affixed to the exterior of said casing upper region, said handle assembly including a lower capacitor housing disposed adjacent the exterior of said casing upper region and an upper hand grip homogeneously extending above said capacitor housing, flanges homogeneously defined on said handle assembly extending downwardly from said capacitor housing in engagement with said casing upper region, fasteners attaching said flanges to said casing upper region, a motor capacitor located within said capacitor housing, an end plate mounted upon and enclosing said casing first end, a pump-motor adapter mounted upon and enclosing said casing second end, tie rods connected to said adapter extending through said end plate and casing mounting said end plate and adapter upon the associated casing end, a motor armature within said casing rotatably mounted upon said end plate and adapter having a shaft extending through said adapter, said adapter having a cyindrical exterior configuration having a maximum diameter substantially corresponding to the motor casing diameter and concentric therewith, a pump assembly mounting base defined upon said adapter, said shaft extending through said mounting base, a

pump assembly mounted upon said mounting base including a pump rotor directly mounted upon said armature shaft, a substantially cylindrical shell having an inner open end and an outer closed end enclosing said pump assembly and defining a chamber about said pump assembly, said shell having a diameter substantially corresponding to the diameter of said motor casing and adapter and concentric therewith, said shell open end being sealingly mounted upon said adapter, an inlet port defined in said adapter in communication with said pump assembly, an exhaust port defined in said pump assembly in communication with said chamber, an outlet port defined in said shell in communication with said chanber, said pump assembly including a rotor block having a cavity defined by a circumferential surface, vanes mounted upon said pump rotor engaging said cavity circumferential surface, said pump assembly exhaust port including an exhaust orifice defined in said rotor block intersecting said circumferential surface and the exterior of said rotor block, a relief pocket defined in said





cavity circumferential surface intersecting said exhaust orifice having a circumferential dimension greater than that of said orifice, a resilient reed valve mounted on the exterior of said rotor block controlling egress through said orifice, said relief pocket increasing the effective gas pressure upon said reed valve during exhausting, an exhaust riser mounted upon the exterior of said rotor block, said riser comprising a hollow vertically oriented jacket having an upper end and an opening disposed toward said rotor block, a single threaded shaft extending through said jacket and said reed valve threaded into said rotor block, first and second nuts threaded on said shaft holding said reed valve and said jacket against said rotor block, respectively, said reed valve extending through said jacket opening and located within said jacket, and an exhaust deflector conduit mounted on said jacket extending from the upper end thereof in communication with said jacket and having a horizontally disposed discharge for discharging exhausted gas into said chamber.

4,631,007

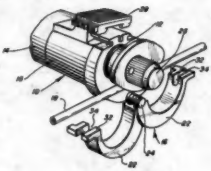
PRESSURE PUMP HAVING JAWS AND END-SLOTS

Raymond G. Olson, Niles, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 572,496, filed as PCT US83/00528, Apr. 11, 1983, published as WO83/04285, Dec. 8, 1983, § 102(e) date Oct. 24, 1983, Pat. No. 4,540,351, which is a continuation-in-part of Ser. No. 380,977, May 24, 1982, abandoned. This application Jun. 27, 1985, Ser. No. 749,604

Int. Cl.[4] F04B *43/12*; A61M *1/00, 25/00*

U.S. Cl. 417—476 2 Claims



1. In a pressure pump for conveying fluids through tubing which comprises a pressure member of generally circular periphery, means for moving said pressure member in orbital motion about said pressure member and spaced for receiving and retaining the flexible tubing in an annular space between the pressure member and the sleeve member with the flexible tubing surrounding said pressure member for pumping of fluids through said flexible tubing, the sleeve member being divided into a pair of jaws hinged together at one end to permit opening and closing of the jaws about the pressure member to facilitate installation of the flexible tubing, the improvement comprising, in combination:

said jaws including end surfaces which abut together when said jaws are in the closed position and means defining slots in said end surfaces for accommodating passage of said flexible tubing into and out of said annular space when said end surfaces of said jaws are in abutting relation, and

movable latch means defining a slot for retaining said end surfaces of said jaws in abutting relation, said latch means being positionable adjacent a region of said flexible tubing when said end surfaces of said jaws are retained in abutting relation so that said flexible tubing which passes through said slots in said jaw end surfaces is folded about an angle which is substantially 180 degrees with said tubing extending from said abutting jaw surfaces.

4,631,008

PERISTALTIC PUMP HOUSING

Gustav H. Stenner, Jacksonville, Fla., assignor to G. H. Stenner & Co., Inc., Jacksonville, Fla.

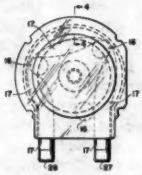
Filed Nov. 4, 1985, Ser. No. 794,560

Int. Cl.[4] F04B *43/12*; B65D *41/18*

U.S. Cl. 417—477 6 Claims

1. In a peristaltic pump having a housing, a roller assembly, a flexible feeder tube, and a housing cover, the improvement which comprises a tapered tongue member around the outer perimeter of said housing adapted to frictionally engage a recess around the outer perimeter of said housing cover to

close tightly said cover onto said housing without need for additional fastening means, said housing being generally cylindrical about a central longitudinal axis, said tongue member includes an inward cylindrical surface generally parallel to said



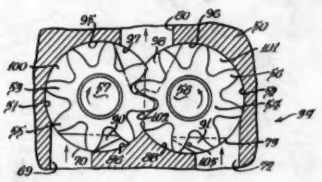
axis and an outward frustoconical surface wherein the angle of taper is about 5°–15° from said axis, the outer extremity of said frustoconical surface being larger in diameter than the inner end of said tongue.

4,631,009

LUBRICATION SCAVENGE SYSTEM

John E. Cygnor, and John Hallman, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 18, 1984, Ser. No. 631,922
Int. Cl.⁴ F04C *2/18, 15/00*
U.S. Cl. 418—15 **6 Claims**



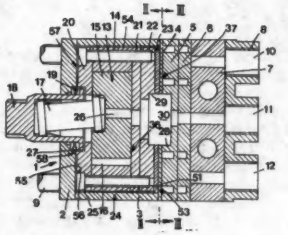
1. A dual inlet gear pump operable in either a pumping mode or a metering mode for scavenging fluid from a pair of compartment outlets and wherein the fluid at said compartment outlets may alternate between air or oil or a mixture thereof comprising, a pump housing having a pair of inlet ports for association one with each of said compartment outlets and a single discharge port, a pair of separate fill slots in said housing communicating one with each of said inlet ports, said housing having a pair of generally cylindrical pump chambers, a pair of rotatable meshing gears in said pump chambers which separately rotate past an associated fill slot to carry fluid to the discharge port, portions of the walls of said pump chambers defining inlet and discharge seal arcs for each gear to preclude any direct fluid communication between the inlet ports and between the inlet ports and the discharge port, said inlet seal arcs extending between the leading edge of each fill slot and the intersection of said pump chambers and at least equal to the spacing between adjacent gear tooth tips and the discharge seal arcs being at least equal to the spacing between adjacent gear tooth tips and extending between the discharge port and the trailing edge of the fill slots, bearing means pressure loaded against the end faces of the gears, and a passage through said bearing means which communicates with only one of said inlet ports when the pump is used in a metering mode to provide said pressure loading without creating a flow path between the inlet ports.

4,631,010

HYDROSTATIC CONTROL DEVICE, PARTICULARY STEERING DEVICE

Hans C. Petersen, Nordborg, and Erik Kyster, Augustenborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Nov. 10, 1983, Ser. No. 550,320
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1983, 3243401
The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.
Int. Cl.⁴ F03C *2/08;* F16D *31/02*
U.S. Cl. 418—61 B **15 Claims**



1. A hydrostatic steering control device, comprising, a housing having a plurality of ports including inlet and outlet ports and motor ports connectable to an external servomotor, a metering motor having a casing rotatably mounted in said housing, a rotor mounted in said metering motor casing and being moveable relative thereto to form expansible and collapsible chambers, control shaft means connected to said rotor, directional valve means having opposite turn functions, said directional valve means having relatively rotatable planar faces between said housing and said metering motor casing and being operable upon said shaft means turning said casing and said rotor in unison, commutating valve means between said metering motor casing and said rotor, resilient means for maintaining said directional valve means in a neutral position in the absence of a turning force on said shaft, passage means cooperable with and connecting said housing ports with said directional valve means and said commutating valve means, said directional valve means being operable for each said turning function to (1) route pressure fluid from said inlet port through one side of said commutating valve means to expanding chambers of said metering motor and pressurized fluid from collapsing chambers of said metering motor to one of said motor ports and (2) route fluid from the other of said motor ports to said outlet port, means providing in one of said planar surfaces an annularly shaped high pressure zone near the periphery thereof, first throttle means between said planar surfaces radially outwardly from said high pressure zone, said housing and said metering motor casing having adjacent annularly shaped wall means at the opposite end thereof from said directional valve means, second throttle means between said adjacent wall means providing an intermediate pressure zone between said first and second throttle means and a low pressure zone downstream from said second throttle means, said adjacent wall means upstream from said second throttle means being sufficient relative to said high pressure zone to provide a net pressure force in a direction biasing said directional valve planar faces towards each other.

4,631,011

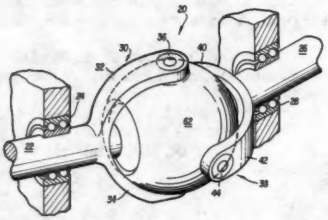
FLUID HANDLING DEVICE USEFUL AS A PUMP, COMPRESSOR OR ROTARY ENGINE

Roger R. Whitfield, 501 Robin Dr., Lynchburg, Va. 24502

Continuation-in-part of Ser. No. 709,381, Mar. 7, 1985, abandoned. This application Dec. 20, 1985, Ser. No. 811,414

Int. Cl.[4] F01C *3/06*; F03C *2/00*; F04C *3/00*

U.S. Cl. 418—68 **3 Claims**



1. A fluid handling device having a plurality of variable volume chambers for use as a pump, compressor or rotary engine which comprises:

a. a first rotary shaft member supported by bearings and carrying variable volume chamber forming components having at least a pair of angularly disposed flat surfaces and a curvilinear shell portion,

b. a second rotary shaft member supported by bearings and carrying variable volume chamber forming components having at least a pair of angularly disposed flat surfaces and a curvilinear shell portion,

(1) said shaft members being disposed at an angle other than 180° to one another,

c. a centrally disposed disk member forming a plurality of variable volume chambers with the flat surfaces of said variable volume chamber forming components,

(1) said centrally disposed disk member carrying a curvilinear shell member engageable in sealing relationship with said curvilinear shell portions of each of said variable volume chamber forming components,

(2) and said centrally disposed disk member being journalled within bearings carried by a pair of yoke members externally of said curvilinear shell member carried by said disk member and with one of said yoke members being displaced 90° with respect to said other yoke member,

(3) one of said yoke members being attached to said first rotary shaft member and the other of said yoke members being attached to said second rotary shaft member.

4,631,012

PNEUMATIC TOOLS

Richard E. Eckman, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 426,516, Sep. 29, 1982, abandoned. This application Nov. 25, 1985, Ser. No. 778,953

Int. Cl.[4] F03C *2/00*

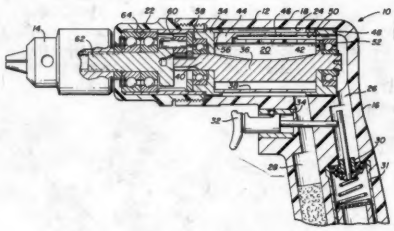
U.S. Cl. 418—70 **1 Claim**

1. In a pneumatic powered tool, with an improved tool housing and pneumatic motor assembly, comprising:

(a) an elongated motor assembly with a hollow motor cylinder, a motor rotor located in said cylinder and including a shaft portion extending from each end thereof, first and second motor end means receiving shaft portion for journaling said rotor in said motor cylinder and engaging said motor cylinder for holding said motor cylinder, said motor rotor, and said motor end means assembled in an operating relationship;

(b) a hollow cast pneumatic powered tool housing body constructed from a high density plastic material and being hollow for receiving and mounting in a motor end portion thereof as an assembly said motor cylinder, both of said motor end means and said motor rotor, said housing body motor end portion having a hollow interior with an open end portion, a generally cylindrical internal side wall, a closed end portion, and a planer abutment at said closed end portion oriented transverse to said generally cylindrical internal side wall, said generally cylindrical internal side wall being sufficiently larger than the exterior of said motor cylinder and said motor end means so as not to contact said motor cylinder exterior and said motor end means and not provide structural support for said motor cylinder around the cylindrical exterior thereof; and said first motor end means for supporting and positioning said rotor being positioned in abutting and supporting contact with said planer abutment only and said tool housing body having a handle end portion including an air valve means operably mounted therein to control air flow between an air source inlet in said handle portion and said motor assembly through a passageway communicating with said housing closed end portion;

(c) a tool housing end member threadedly mounted to said housing body and mechanically engaged with said motor second end means at said housing body open end portion



to compressively clamp and physically retain said motor assembly in an operating position wherein said first motor end means is positioned in abutting and supporting contact with said planer abutment and supporting contact with said planer abutment in said tool housing and also mounted in air flow sealing contact with said planer abutment in order to insure air flow through said tool housing closed end portion from said air valve means to said motor assembly;

(d) said first and second motor end means each receive one of said shaft portions for journaling said motor rotor in said motor cylinder and for holding said motor cylinder, said motor rotor and both of said motor end means in an operating relationshp;

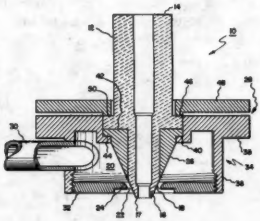
(e) each of said motor end means includes a counterbore in facing sides thereof for receiving and mounting therein each one an end portion of said motor cylinder and said motor rotor in an operating relationship; and

(f) one of said motor shaft portions being an output shaft being a sun gear of a planetary gear assembly having gear teeth formed thereon to be operably engageable with a planetary gear assembly upon installation of said motor assembly in said tool housing body to provide an output drive for mounting a drive bit chuck.

4,631,013
APPARATUS FOR ATOMIZATION OF UNSTABLE MELT STREAMS

Steven A. Miller, Amsterdam, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 29, 1984, Ser. No. 584,689
Int. Cl.[4] B22F 9/08
U.S. Cl. 425—7 3 Claims



1. An atomization apparatus for atomization of a melt at high temperature comprising:

a ceramic melt delivery tube having a melt entry end and a melt discharge end for delivery of a stream of melt of solid cross section to a zone at the discharge end of said tube,

a gas delivery system surrounding said melt delivery tube and including a gas delivery orifice extending completely around the discharge end of said melt delivery tube and closely coupled to said discharge end for delivery of atomizing gas at elevated pressure against the discharge end of said tube and into said zone,

said melt delivery tube having the discharge end internally shaped to expand the external configuration of the melt stream in the melt delivery tube and thereby to increase the extenral surface area per unit volume of melt flowing from the melt discharge end of said melt delivery tube into said zone, and

said melt delivery tube having the discharge end externally tapered and shaped to conform to the internal shape thereof.

4,631,014
HYDRAULIC CURING PRESS

Günter Drewel, Seevetal; Horst Enoch, and Klaus Grotkasten, both of Hamburg, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Fed. Rep. of Germany

Filed Nov. 21, 1985, Ser. No. 800,464
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 3443730
Int. Cl.[4] B29C 33/28, 35/00
U.S. Cl. 425—34 R 10 Claims

1. A hydraulic curing press for molding and vulcanizing a tire, comprising:

a frame;

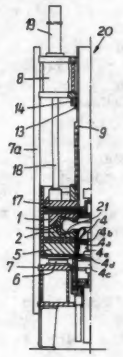
a lower mold part connected to said frame;

an upper mold part defining with said lower mold part a mold cavity;

moving means for displacing said upper part in vertical direction with respect to said lower part so as to allow closing and opening of said mold cavity;

means for accurately guiding said upper part during its displacement by said moving means and including a vertically extending guide bar connected to said upper part at a central area thereof and supported by said frame, said guide bar being provided with an adjusting nut along a predetermined section thereof; and

clamping means for locking said upper part when the latter is closed against said lower part to close said cavity and

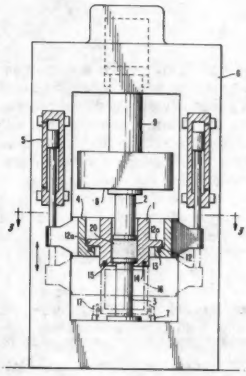


including pivotable clamp jaws embracing said bar and engageable by said adjustng nut.

4,631,015
MOLDING APPARATUS WITH REPLACEABLE PLUNGER AND DIE SET

Iwasaki Shigeo, and Haguchi Hiroshi, both of Okayama, Japan, assignors to Mitsuishi Fukai Tekkosho, Ltd., Bizen, Japan

Filed May 8, 1981, Ser. No. 261,221
Int. Cl.[4] B30B 9/04, 9/28; B29C 43/00
U.S. Cl. 425—195 2 Claims



1. A machine for forming bricks, comprising:

a horizontal mold support having an open center and one side open;

support moving fluid pressure cylinders on which said mold support is mounted for vertical movement in said machine;

an upper fluid pressure cylinder above said open center for exerting a downward thrust;

replaceable sets each consisting of an upper plunger, a metallic mold having an open upper end into which said plunger fits for compressing brick material within said mold and an open lower end, and a lower plunger which fits into the open lower end of said mold for compressing brick material within said mold, an upper plunger, metallic mold and lower plunger when in position in said ma-

chine being aligned vertically with said upper fluid pressure cylinder, and having said mold removably held within said mold support, and said lower plunger having a diameter less than the open side of said mold support for being movable out of said mold support through said open side;

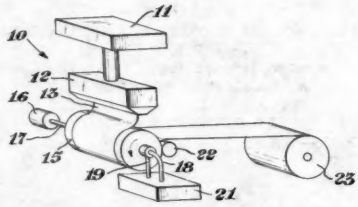
whereby when said replaceable set is positioned in said machine, the upper fluid pressure cylinder can press the plungers downwardly with said lower plunger against the bottom of the machine, and said support moving fluid pressure cylinders can move said mold support with said mold relative to said plungers, and when it is desired to replace said set, said mold support can be moved downwardly until said open side is aligned with said lower plunger, and said set can be moved laterally out of said mold support and be replaced by a set of a different mold and an upper and a lower plunger.

4,631,016

FILM CASTING APPARATUS INCLUDING HEAT TRANSFER ROLL

Robert A. Hay, II, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 30, 1985, Ser. No. 781,814
Int. Cl.[4] B29C *39/38*
U.S. Cl. 425—224 **8 Claims**



1. A heat transfer roll, comprising a static mandrel having a longitudinal axis, a drive end and a heat transfer fluid end; the mandrel having a centrally disposed heat transfer passage, the mandrel having a first bearing mounted external thereto adjacent the heat transfer fluid end and a second bearing mounted adjacent the drive end; a jacket for heat transfer fluid surrounding the mandrel between the bearings, a plurality of generally radially extending axially spaced conduits disposed between the bearings and providing communication between the heat transfer passageway within the mandrel and space external to the jacket, the jacket defining a plurality of axially spaced passageways which provide communication between space external to the jacket and a generally annular space disposed between the jacket and the mandrel, means external to the mandrel to provide passage of the heat transfer liquid to space internal to the mandrel and means to provide communication between the annular space between the mandrel and the jacket and space external to the mandrel, a cylindrical rotatable roll member disposed external to the jacket and rotatably supported on the bearings; the roll member defining a plurality of internal baffles, the roll member being free to rotate on the bearings.

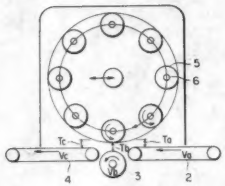
4,631,017

APPARATUS FOR ROLLING PLASTIC DOUGH

Torahiko Hayashi, Utunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Japan

Filed Oct. 21, 1985, Ser. No. 789,559
Claims priority, application Japan, Oct. 20, 1984, 59-220767
Int. Cl.[4] A21C *3/02*
U.S. Cl. 425—335 **4 Claims**

1. An apparatus for rolling plastic dough, comprising a frame; a conveyor assembly consisting of an intake conveyor, an outlet conveyor, and center roller positioned between the two conveyors, the conveyors and the center roller having driving means such that the peripheral speed of the center roller is greater than the speed of the intake conveyor and the speed of the outlet conveyor is greater than the peripheral speed of the center roller; and an endless roller mechanism having a plurality of rollers arranged above the conveyor assembly and with an arcuate path for the rollers at its bottom, the endless roller mechanism being movable forwardly and rearwardly, as a whole, along the conveyance path of the conveyor assembly to adjust the thickness of the dough to be flattened, and the center roller being vertically movable to satisfy the formula:



$$Ta > Tb > Tc$$

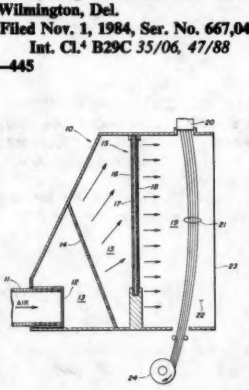
wherein Ta is the distance between the rear end of the conveyance path of the intake conveyor and the outermost periphery of the roller path of the endless roller mechanism, Tb is the distance between the center roller and the outermost periphery of the roller path of the endless roller mechanism, and Tc is the distance between the front end of the conveyance path of the outlet conveyor and the outermost periphery of the roller path of the endless roller mechanism.

4,631,018

PLATE, FOAM AND SCREEN FILAMENT QUENCHING APPARATUS

Ramunas L. Valteris, Seaford, and Gary L. Caldwell, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 1, 1984, Ser. No. 667,049
Int. Cl.[4] B29C *35/06, 47/88*
U.S. Cl. 425—445 **2 Claims**



1. In an apparatus for quenching synthetic filaments which includes: an elongated chimney, a porous open-celled foam sheet, dividing said chimney longitudinally into a plenum chamber and a quenching chamber, through which filaments pass in a path from an extrusion device to a means for collecting filaments and a means to supply a flow of gas to the plenum chamber, the improvement of which comprises: a mesh screen coextensive with the foam sheet positioned between the foam

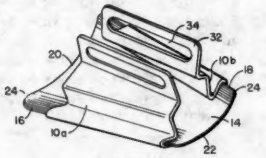
sheet and the quenching chamber wherein the screen is from about a 50 mesh screen to about a 150 mesh screen.

4,631,019

COMBINATION APPLICATOR AND SHAPER FOR MOLDABLE MATERIALS

Bruce F. House, 2249 E. Goldpearl La., Hernando, Fla. 32642

Filed Nov. 4, 1985, Ser. No. 794,840
Int. Cl.[4] B05C *17/10*
U.S. Cl. 425—458 6 Claims



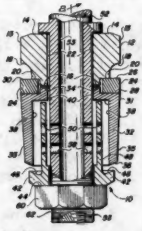
1. A combination applicator and shaper for moldable materials comprising, in combination, a flat, resilient spreader member, said spreader member defining a regular trapezoid in peripheral shape having the axis of symmetry about its longitudinal axis, and a pair of handle members removably attachable along the mutually convergent marginal longitudinal edge portions of said spreader member to facilitate manual bending of said spreader member about its axis of symmetry.

4,631,020

SEGMENTED BLOW PIN FOR MOLDING MACHINES EMPLOYING REPLACEABLE CUTTING RING

Robert E. Frankenberg, and Mark A. Calderazzo, both of Orlando, Fla., assignors to Sewell Plastics, Inc., Atlanta, Ga.

Filed Nov. 14, 1985, Ser. No. 797,928
Int. Cl.[4] B29C *49/58*
U.S. Cl. 425—527 17 Claims



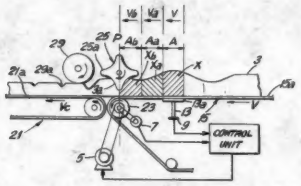
1. A blow-pin apparatus for a blow-molding machine, comprising: a blow-tube for introducing fluid into a parison: a first member mounted on said blow-tube; a second member, mounted on said blow tube, separable from said first member and juxtaposed adjacent to said first member; a radially perforated cylindrical sleeve member extending at least partially through said second member; a replaceable cutting member position between said first member and said second member; and means for holding said first and said second members together with said cutting member positioned therebetween.

4,631,021

APPARATUS FOR QUANTIFYING THE FLOW RATE OF DOUGH

Torahiko Hayashi, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Japan

Filed Apr. 1, 1985, Ser. No. 718,126
Claims priority, application Japan, Apr. 3, 1984, 59-65837; May 21, 1984, 59-102321
Int. Cl.[4] B29C *47/92*
U.S. Cl. 425—140 10 Claims



1. An apparatus for quantifying the flow rate of dough, comprising a feed conveyor assembly for continuously feeding the dough, a dough weighing device continuously measuring the weight of each portion of the dough conveyed past the weighing device, said dough weighing device being located between the opposite ends of the conveying portion of said feed conveyor assembly, a first pressing means disposed at a predetermined fixed position above and adjacent to the rear end of said feed conveyor assembly, said first pressing means being adapted to rotate about its own axis at substantially the same linear speed as the conveyor speed of at least the rear end portion of said feed conveyor assembly, a constant-speed conveyor arranged in series with and adjacent to said feed conveyor assembly, a second pressing means disposed at a predetermined fixed position above and adjacent to the front end of said constant-speed conveyor, said second pressing means comprising a single roller element adapted to rotate about its own axis at substantially the same linear speed as the speed of said constant-speed conveyor, a control unit for controlling the speed of at least the rear end portion of said feed conveyor assembly at a speed inversely proportional to the weight of a dough portion measured so as to make constant the weight of dough per unit length.

4,631,022

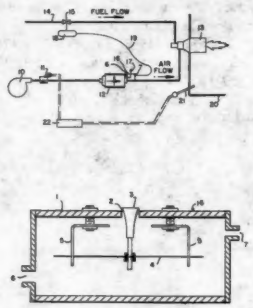
HEAT RECUPERATOR WITH COMPENSATOR FOR PRESSURE OPERATED FUEL REGULATOR

John L. Ferri; William C. Fulkerson; Ray L. Newman, and Jeffrey M. Gonzalez, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 15, 1983, Ser. No. 561,759
Int. Cl.[4] F23N *1/00*
U.S. Cl. 431—90 4 Claims

1. The combination of a heat recuperator and a compensator for a pressure operated fuel regulator, the recuperator having means for heating air to be used for combustion of fuel the flow of which is controlled by the fuel regulator, means for supplying recuperator-heated air to the compensator, means for delivering outlet pressure from the compensator to the fuel regulator, the compensator comprising a housing having an opening for bleeding air therethrough, a tapered plug in the opening, the tapered plug being fastened to a thermostatic metal within the housing, the cross sectional area of the plug being less than the area of the opening, the clearance around the plug being a free flow area through which air bleeds out of the compensator, the thermostatic metal being heated by air entering the compensator so that when the temperature of the air

increases, the thermostatic metal is heated and deflected and displaces the plug within the opening, thereby increasing the



free flow area and bleeding more air out of the compensator, thereby increasing the pressure drop across the compensator.

4,631,023

BURNER FOR GAS BLOW TORCH

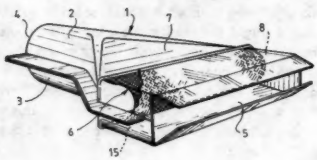
Claude Courrege, La Haillan, France, assignor to Rippes S.A., France

Continuation-in-part of Ser. No. 345,749, Feb. 4, 1982, abandoned, which is a continuation of Ser. No. 40,953, May 21, 1979, abandoned. This application Dec. 27, 1985, Ser. No. 813,760

Claims priority, application France, May 29, 1978, 78 16497

Int. Cl.[4] F23D *14/14*

U.S. Cl. 431—329 **6 Claims**



1. A gas burner for burning a high velocity gas to produce an external flame having a homogeneous front portion, wherein said gas burner comprises:

gas injecting means having a nozzle connected to a source of inflammable gas under pressure;

a tube through which said inflammable gas is injected, said tube having an inlet portion connected to said nozzle and an outlet portion;

at least an air passage debouching in said tube close to said nozzle, so as to form with said nozzle and said tube a jet pump which creates through said tube a flow of a combination of air and inflammable gas at high speed oriented towards said outlet portion;

an adaptation chamber having first and second sections, said first section comprising a first entrance portion connected to said outlet portion and a first outlet orifice and extending from said entrance portion to said first outlet orifice, a first top wall, a first bottom wall and first and second opposite lateral walls, said first top wall and bottom wall converging inwardly towards each other and increasing in width from said entrancé portion to said outlet orifice and said first and second opposite lateral walls diverging from the first entrance portion to the first outlet orifice, said second section comprising a tubular portion having an inlet orifice connected to said first outlet orifice and a second outlet orifice and a second top wall, and a second bottom wall which are substantially parallel to each other and extend respectively from said first top wall and said first bottom wall, and third and fourth substantially parallel lateral walls which extend respectively from said first and said second lateral walls;

two deflectors connected to said second section and extending respectively from said second top wall and said second bottom wall, said first and second deflectors converging towards each other from said second outlet orifice and having two respective parallel front edges, spaced from each other by a first distance;

a curved diffusion grill having a curvature axis which is parallel to said second top and bottom walls and extends perpendicularly to said third and fourth lateral walls, said curved diffusion grill having two substantially parallel longitudinal edges which are respectively connected to said second top wall and to said second bottom wall, two elongated zones respectively formed between said grill and said second top and bottom walls, and two lateral curved edges which are respectively connected to said third and fourth lateral walls, said two longitudinal zones respectively delimiting with said second top and bottom walls two passageways each forming a dead space into which the flame does not spread.

4,631,024

CATALYTIC COMBUSTION DEVICE

Tsuneo Shibata, Kawanishi; Yoshitaka Mohri, Minoo; Haruo Ida, Sakai, and Haruo Ishikawa, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

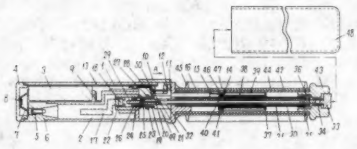
PCT No. PCT/JP84/00192, § 371 Date Dec. 18, 1984, § 102(e) Date Dec. 18, 1984, PCT Pub. No. WO84/04377, PCT Pub. Date Nov. 8, 1984

PCT Filed Apr. 16, 1984, Ser. No. 682,671

Claims priority, application Japan, Apr. 20, 1983, 58-70360; Apr. 20, 1983, 58-70362; Apr. 22, 1983, 58-71667; Jul. 8, 1983, 58-125028

Int. Cl.[4] A45D *1/04*; F23Q *11/00*

U.S. Cl. 431—268 **6 Claims**



1. In a catalytic combustion device including a catalyst for oxidation of a fuel vapor and air, and an ignition heater for initiating oxidation on said catalyst, the improvement which comprises a tubular first member carrying thereon said catalyst for supplying the fuel vapor to said catalyst, a tubular second member disposed in said first member defining therein a passageway for the fuel vapor, said second member being secured at its one end to said first member so as to constitute a thermostatic element, and means, cooperating with said first and second members constituting said thermostatic element, for controlling the rate of fuel vapor flow to said catalyst in response to a difference in thermal expansion between said first and second members.

4,631,025

CALCINING PROCESS USING FLUID COKE FUEL

Robert K. Casper, and James F. Runner, both of Wichita, Kans., assignors to Koch Carbon Inc., Wichita, Kans.

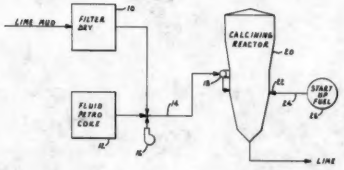
Filed Aug. 20, 1985, Ser. No. 767,614

Int. Cl.[4] F27B *15/00*

U.S. Cl. 432—15 **10 Claims**

1. In a calcining process wherein a material is placed in a

reactor with a combustible fuel for calcination, the improvement comprising:



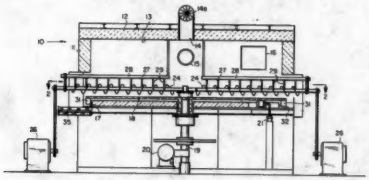
introducing into said reactor a quantity of fluid petroleum coke.

4,631,026

ROTARY TURNTABLE FURNACE FOR LITHARGE PRODUCTION

Benjamin F. McKinney, Indianapolis, Ind., assignor to Oxide & Chemical Corporation, Indianapolis, Ind.

Filed Nov. 8, 1985, Ser. No. 796,236
Int. Cl.[4] F27B *9/16*
U.S. Cl. 432—138 **7 Claims**



1. A furnace for heating particulate material comprising:

top and side refractory walls defining a furnace chamber, at least one of said refractory walls defining a feed inlet for feeding particulate matter into said chamber, a discharge outlet for discharging said particulate material outside said chamber, and a burner inlet communicating inside said chamber:

heating means associated with said burner inlet for heating said particulate matter within said chamber:

a turntable hearth rotatably driving said hearth:

a distributing means, including at least one screw auger rotatably disposed above said turntable hearth, for mixing and conveying the contents of said chamber in a radial direction relative to said first axis of rotation of said turntable hearth by screw movement simultaneously with the rotation of said particulate material on said turntable hearth about said first axis of rotation, said distributing means including first and second screw augers angularly spaced apart relative to the first axis of rotation of said turntable hearth, said second screw auger having an opposite pitch from said first screw auger;

a second drive means connected to said screw auger for rotatably driving said screw auger in said chamber; and

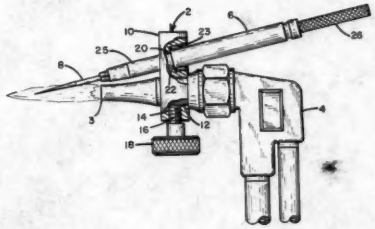
a third drive means connected to said second screw auger for rotatably driving said second screw auger at a slower speed than said first screw auger, said first and second screw augers distributing said particulate material in opposite radial directions relative to the center of said turntable hearth.

4,631,027

METHOD AND APPARATUS FOR SHARPENING TUNGSTEN ELECTRODES

Charles H. Lindberg, 4294 Helm Rd., Duluth, Minn. 55811

Filed Mar. 18, 1985, Ser. No. 712,687
Int. Cl.[4] F27B *14/00*; B29C *35/02*; B23K *7/00*; F24J *3/00*
U.S. Cl. 432—13 **10 Claims**



8. A method for flame sharpening a welding electrode including the steps of:

(a) mounting a blunt welding electrode at an acute angle in the range of 10 to 20 degrees in engulfed relation to the flame of a heat source capable of temperatures in excess of 5500° F.; and

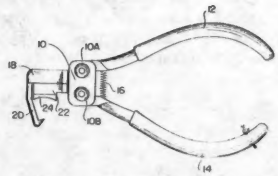
(b) rotating the electrode as the electrode material is vaporized until a needle-like point profile is obtained.

4,631,028

ORTHODONTIC TOOL

Craven H. Kurz, No. 6 North Star, Apt. 106, Marina del Rey, Calif. 90291

Filed Sep. 20, 1982, Ser. No. 420,276
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—4 **2 Claims**



1. A tool for removing an adhesively bonded orthodontic appliance from the lingual surface of a tooth which comprises: a transverse support member; first and second sections pivotally coupled to said support member at transversely spaced pivot points for pivotal movement about spaced pivotal axes, said first and second sections defining first and second handles and upper and lower jaws for the tool; a head portion formed on the lower jaw in position to engage the top of a tooth; and a unitary one-piece elongated depending portion positioned on the upper jaw in overhanging relationship with the lower jaw and having an integral catch member at the distal end thereof in position to extend down behind the tooth and under the edge of the appliance when the head portion engages the top of the tooth for removal of the appliance from the tooth.

4,631,029

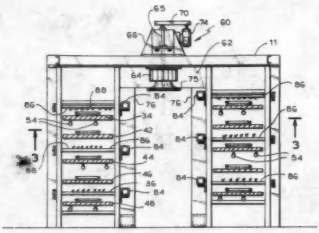
BAKING OVEN WITH HEATED AIR DISTRIBUTION-II

William E. Lanham, Conyers, and Stephen R. Smith, Tucker, both of Ga., assignors to Lanham Machinery Company, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 559,892, Dec. 9, 1983, Pat. No. 4,544,352. This application Sep. 25, 1985, Ser. No. 780,967

Int. Cl.[4] F27B *9/00*

U.S. Cl. 432—133 6 Claims



1. A baking oven comprising an oven enclosure; a generally spiral conveyor within said enclosure including an ingress conveyor section for carrying bakery goods to be baked into said enclosure, a first conveyor tier leading from said ingress conveyor section, a plurality of further conveyor tiers serially arranged with respect to each other, and an egress conveyor section carrying baked bakery goods from a final one of said conveyor tiers out of said oven enclosure; heating means within said oven enclosure means for heating the air therewithin for baking the bakery goods being carried on said conveyor tiers in said oven enclosure; and air distribution means for taking heated air from near the top of said oven enclosure and distributing the heated air, through a piping conduit network, between at least selected ones of said conveyor tiers, to provide generally uniform heat distribution with said oven enclosure and minimize stratification of heat therein; said piping conduit network including a plurality of air distribution manifolds within said oven enclosure and extending generally parallel to selected conveyor tiers and a plurality of air distribution pipes connected to and extending generally perpendicular to said manifolds beneath selected conveyor tiers; said heating means including a plurality of heating elements disposed within said oven enclosure and disposed beneath selected ones of the tiers of said spiral conveyor; and said heating elements being disposed beneath alternate ones of said conveyor tiers, while said air distribution pipes are disposed beneath the remaining ones of said conveyor tiers.

4,631,030

EQUIPMENT FOR PUTTING IN APPROXIMAL FILLINGS WITH LIGHT-HARDENING MATERIALS

Beat von Weissenfluh, Gentilino, Switzerland, assignor to Hawe-Neos Dental Dr. H. von Weissenfluh S.A., Gentilino, Switzerland

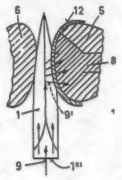
Filed Jun. 18, 1985, Ser. No. 746,058

Claims priority, application Switzerland, Jul. 9, 1984, 3301/84

Int. Cl.[4] A61C *7/00*

U.S. Cl. 433—149 5 Claims

1. Equipment for putting in approximal fillings (between teeth) with light-hardening materials, comprising a wedge (1) transparent to the rays used and adapted to be inserted between the teeth, the wedge having means to refract or reflect concentrated light supplied to it in the axial direction (9) by a light source (10), by deflecting it in the lateral direction (9'), so as to illuminate the filing material (8) with the greatest possible intensity in the approximal part of the cavity, making possible



hardening of the filling material starting from the approximal-apical stratum (8').

4,631,031

ARTIFICIAL DENTAL PROSTHESIS

Ernst-Jürgen Richter, Neupforte 15, 5100 Aachen, Fed. Rep. of Germany

Filed Apr. 11, 1985, Ser. No. 722,262

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1984, 3413811

Int. Cl.[4] A61C *8/00*

U.S. Cl. 433—173 13 Claims

1. A crown attachment comprising:

an implant adapted to be seated in a bone of a jaw and having an attachment end turned away from said bone and having an axis;

a first coupling member fixed to said end of said implant and provided with an annular first formation located along said axis and surrounded by an annular shoulder lying in a plane generally perpendicular to said axis;

a second coupling member formed centrally with a second formation matingly engageable with said first formation with freedom of swivelling and axial mobility therebetween, and with an annular shoulder surrounding said second formation and lying in a plane and juxtaposed with said shoulder of said first coupling member, said shoulders being each formed with a respective groove opening toward the other shoulder and registering with one another;

a dental crown affixed to said second coupling member; and

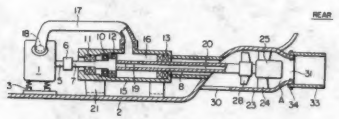
an elastic ring disposed in said grooves and of a material and so associated with the shapes of said grooves as to yieldably resist displacement of said shoulders toward one another with a force/displacement characteristic having a break between an initial section of greater yieldability and an adjacent subsequent section of lesser yieldability.

4,631,032

ENGINE EXHAUST APPARATUS FOR WATER-JET PROPULSION BOAT

Hiroshi Nishida, Miki, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jan. 22, 1985, Ser. No. 693,097
Claims priority, application Japan, Jan. 27, 1984, 59-14123
Int. Cl.[4] B63H *11/103*
U.S. Cl. 440—47 6 Claims



4. A propulsion apparatus for a water jet propulsion boat having a hull, a water jet pump casing with said hull, and an impeller in said pump casing driven by an engine in said hull, said propulsion apparatus comprising:

means in said pump casing defining a converging passage for increasing water flow velocity and having a smaller diameter section within which water jet pressure is reduced due to the increase in velocity;

a hollow impeller shaft defining an exhaust passage within an inner wall of said impeller shaft, said exhaust passage being communicated at a forward end portion of said impeller shaft with an exhaust port of said engine;

means connecting said impeller to said impeller shaft:

an exhaust outlet communicating with said exhaust passage formed in said impeller shaft and located rearward of said impeller and within said smaller diameter section of said pump casing to discharge exhaust into a water jet portion of higher velocity and reduced pressure within said section,

said exhaust outlet communicating at a rear end surface of said impeller shaft, and

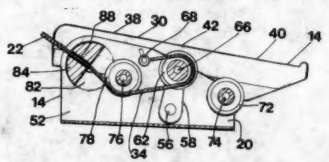
a centrifugally operated stop valve for said outlet operated by said impeller shaft.

4,631,033

OUTBOARD MOTOR FOOT CONTROL WITH ADJUSTABLE CABLES

Eugene P. Menne, Mankato, Minn., assignor to Johnson Fishing, Inc., Mankato, Minn.

Filed Apr. 23, 1984, Ser. No. 602,774
Int. Cl.[4] B60L *15/20*; B63H *25/00*
U.S. Cl. 440—7 18 Claims



1. In a portable outboard motor foot control device of the type having a base, a pedal mounted thereto pivotably about an axis, and at least one cable extending therefrom toward the motor, the improvement comprising:

(a) a cable house secured to the base adjacent to the pedal, said at least one cable being secured within said cable house and exiting said cable house to extend toward the controlling motor and

(b) adjustable means rotatable about a substantially horizontal axis through a substantial arc on the cable house to set the direction of said at least one cable as it exits the cable house to firmly orient said at least one cable in various directions in a vertical plane as necessary to avoid nearby obstacles.

4,631,034

OUTBOARD MOTOR FOOT CONTROL

Eugene P. Menne, Mankato; William B. Lagerquist, North Mankato, and Del P. Decko, Mankato, all of Minn., assignors to Johnson Fishing, Inc., Mankato, Minn.

Filed Apr. 23, 1984, Ser. No. 602,773
Int. Cl.[4] B63H *25/02*
U.S. Cl. 440—7 20 Claims

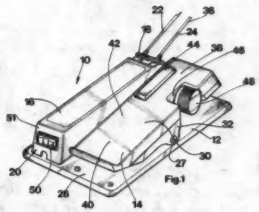


Fig.1

1. In a portable outboard motor foot control device of the type having a base, a pedal mounted thereto pivotably about an axis, and first and second pull-cables each of which have an end secured within the device and extend from the front thereof toward the controlled motor, the improvement comprising:

a cable house secured to the base adjacent to the pedal and having front and rear ends;

a pivot shaft linked to the pedal and extending into the cable house;

a lever arm fixed to the shaft within the cable house and having first and second cable-turning means thereon movable therewith between forward and rearward positions;

means securing the end of the first cable at a first position in front of the first turning means, said first cable extending from the first position around the first turning means to exit the front end of the cable house;

a third cable-turning means secured within the cable house to the rear of the second turning means; and

means securing the end of the second cable at a second position to the rear of the second turning means, said second cable extending from the second position around the second turning means and from there around the third turning means to exit the front end of the cable house;

whereby movements of the lever arm toward its forward and rearward positions pull the second and first cables, respectively.

4,631,035

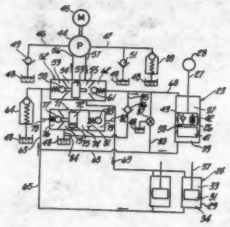
HYDRAULIC TILT DEVICE FOR MARINE PROPULSION UNIT

Ryoji Nakahama, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Feb. 22, 1985, Ser. No. 704,708
Claims priority, application Japan, Feb. 23, 1984, 59-31416
Int. Cl.[4] B63H *5/12*
U.S. Cl. 440—61 17 Claims

1. In a hydraulic tilt and trim unit for a marine outboard drive pivotal about a generally horizontal axis between a tilted up position and a tilted down position comprising a double acting fluid motor operatively connected between said outboard drive and the associated watercraft for pivotal movement of said outboard drive about said horizontal axis upon operation of said fluid motor, a reversible pump having a first port operative as a suction port when said fluid pump is operated in a forward direction and was a pressure port when said fluid pump is operated in a reverse direction and a second port

operative as a pressure port when said fluid pump is operated in the forward direction and as a suction port when the fluid pump is operated in the reverse direction, and conduit means for delivering fluid from said first port to drive said fluid motor in a lifting direction when said fluid pump is operated in its reverse direction for effecting pivotal movement of said outboard drive toward its tilted up position and for delivering



fluid from said second port when said fluid pump is operated in its forward direction to drive said fluid motor in its lowering direction to effect pivotal movement of said outboard drive toward its tilted down position, the improvement comprising means for discharging fluid from said fluid motor when operated by said pump in its lowering direction without having to flow through the first fluid pump port.

4,631,036

STERN FIN FOR SINGLE-PROP SHIP

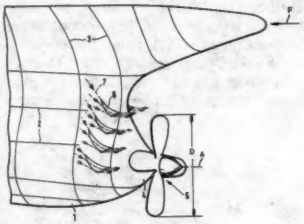
Hermann Grothues-Spork, Heimat 61, D-1000 Berlin, Fed. Rep. of Germany

Filed Jul. 5, 1984, Ser. No. 628,016

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324753

Int. Cl.[4] B63H *1/18*

U.S. Cl. 440—66 **15 Claims**



1. In combination with a ship having a stern provided with a propeller that rotates in a plane and about a horizontal midline ship axis perpendicular to this plane to displace the ship horizontally forward and form a downward and rearward boundary-layer flow,

a plurality of fins secured to and extending horizontally from the stern ahead of the propeller in the ship displacement direction, each such fin being curved and having relative to this direction a swept-back leading edge directed parallel and into the direction of boundary-layer flow at this leading edge and a trailing edge extending parallel to the axis, the fins projecting horizontally from the stern and perpendicular thereto at the respective fin by a distance at most equal to the thickness of the boundary-flow layer.

4,631,037

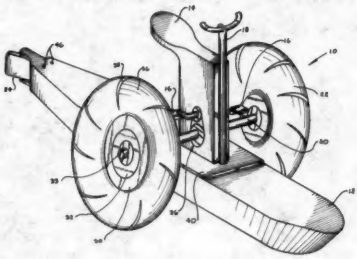
PONTOON VEHICLE

James Dickens, 28 Westland St., Hartford, Conn. 06120

Filed May 31, 1985, Ser. No. 739,519

Int. Cl.[4] B63H *16/00*

U.S. Cl. 440—100 **6 Claims**



1. An aquatic vehicle comprising:

central pontoon means adapted to float on water and including an upper surface thereon, said pontoon means being an elongated, non-circular member extending forwardly and rearwardly of a pair of paddle wheel means;

seat means attached to said upper surface of said pontoon means;

steering means adjacent said seat means and attached to said pontoon means;

a rudder pivotably attached to said pontoon means at one end thereof and being connected to said steering means;

said pair of paddle wheel means being disposed at opposed locations on either side of said pontoon means and being interconnected by an axle wherein said paddle wheel means are adapted to provide buoyancy and propulsion, said paddle wheel means comprising;

a plastic buoyant core;

a fluid tight elastomeric inner tube surrounding said core and having fluid therein;

an outer tube surrounding said inner tube, said outer tube having cleats thereon; and

drive means for dirving said pair of paddle wheel means.

4,631,038

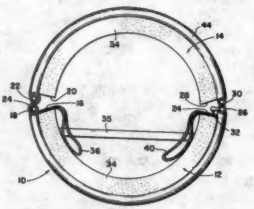
PROTECTIVE CAPSULE

Betty J. Ritter, and Ronald G. Ritter, both of 1826 S. 139 E. Ave., Tulsa, Okla. 74108

Filed Feb. 11, 1985, Ser. No. 700,605

Int. Cl.[4] B63C *9/00*

U.S. Cl. 441—80 **3 Claims**



3. A safety capsule comprising:

a housing having two semi-cylindrical housing sections having adjacent longitudinal side edges hingely secured together to provide alternate open and close position for the capsule and of a legnth to receive an occupant in a completely lying position;

yieldable and bouyant material provided on the inner periphery of the housing for protection of an occupant of the capsule and to provide flotation force for the housing;

a first and a second pair of straps secured along the longitudinal side of at least one of said semi-cylindrical sections;

latching means operable for selectively locking the two semi-cylindrical housing sections in the closed position thereof;

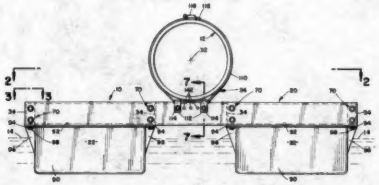
at least two spaced-apart ring shaped roll bars provided on the semi-cylindrical housing sections for protection of the occupant.

4,631,039

PIPE FLOTATION ASSEMBLY

Jon D. Meriwether, Follensbee, W. Va., assignor to Follansbee Steel Corporation, Follansbee, W. Va.

Filed Oct. 25, 1985, Ser. No. 791,317
Int. Cl.[4] B63B *21/52*
U.S. Cl. 441—133 **9 Claims**



1. In a pipe flotation system having a flotation device attached to the underside of a frame member, said frame member having spaced side beam members on which a pipe member is fixedly supported, the improvement comprising: a plurality of longitudinally spaced apertures in each of said side beam members; a pair of bracket members slidably carried on each of said side members; an aperture in each said bracket member selectively alignable with said plurality of apertures in the side member carrying the said bracket member; fastener means extending through aligned apertures of said side member and said bracket member for fixedly securing said bracket member to said side member; clamping means comprising a thin wall band member having a center portion retained between said bracket member and said side member and having end portions extending above the frame member; adjusting means operative between the end portions of said band member for establishing a closed loop defining a transverse opening, and for varying the effective length of the loop to variably size the transverse opening, for said opening to thereby receive said pipe member therethrough, said adjusting means being adjustable to reduce said opening to thereby fixedly clamp said pipe member between said band member and said side member.

4,631,040

CONSTRUCTION TOY SET

Masami Shiraishi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 683,248
Int. Cl.[4] A63H *17/00*
U.S. Cl. 446—95 **12 Claims**

1. A toy construction set which comprises:

at least one base, said base having a base moving means for moving said base on a support surface;

said base including at least one connector of a first type;

at least one housing;

said housing including at least one connector of a second type;

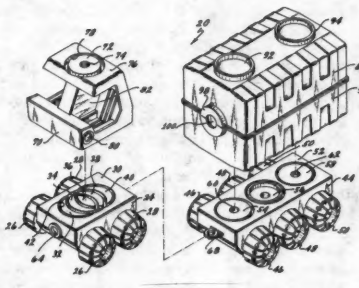
one of said first and said second type connectors being a first male connector and the other of said first and said second connectors being a first female connector;

said first male connector shaped as a truncated conical element;

said first female connector shaped as a hollow truncated conical boss;

said first male connector sized to fit into and frictionally connect to said first female connector so as to temporarily connect said housing to said base;

at least one mushroom shaped element comprising a connector of a third type, said connector of said third type independent of each of said base and said housing and including a first male connector and, further, including an elongated cylindrical section projecting perpendicularly from the center of the base of said first male connector;



said housing including at least one opening located on said housing and forming a connector of a fourth type, said connector of said fourth type sized and shaped such that said elongated cylindrical section of said third type connector fits into and is temporarily contained in said fourth type connector;

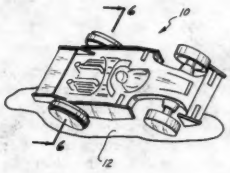
said base and said housing temporarily connectable by said connectors of said first, said second, said third and said fourth types.

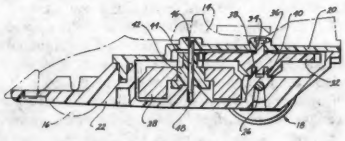
4,631,041

MINIATURE FLYWHEEL CAR FOR SIDE-WHEELIE STUNTS

Richard Chang, Rolling Hills Estates, and Walter Nakano, Manhatten Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 27, 1986, Ser. No. 823,169
Int. Cl.[4] A63H *1/00*
U.S. Cl. 446—233 **3 Claims**





1. A toy car for performing side-wheelie stunts comprising:

a bottom chasis having a first aperture and an annular extension;

front and rear axles rotatably engaging said bottom chasis;

a top chasis attached to said bottom chasis having second and third apertures;

front wheels attached to said front axle having sides made out of a low friction material;

rear wheels attached to said rear axle having sides made out of a low friction material and a high friction material surrounding the perephery of each of said rear wheels;

a bevel pinion gear attached to said rear axle;

a change gear having an extension rotatably engaging said second aperture of said top chasis and an annular groove rotatably engaging said annular extension of said bottom chasis, said change gear having a vertical spin axis and engaging said bevel pinion gear;

a pin having one end thereof rotatably engaging said third aperture in said top chasis and the other end thereof rotatably engaging said first aperture in said bottom chasis, said pin having a vertical longitudinal axis;

a pinion gear attached to said pin, said pinion gear rotating about said vertical longitudinal axis of said pin and engaging said change gear; and

a flywheel attached to said pinion gear, said flywheel having a vertical spin axis and a center of gravity substantially located in a horizontal plane passing through the longitudinal axis of said rear axle so that said toy car is capable of balancing on said sides of said front and rear wheels when said toy car is performing side-wheelie stunts on a supporting surface and said longitudinal axis of said rear axle substantially approaches a vertical position when said toy car is performing said side-wheelie stunts.

4,631,042

INFINITELY VARIABLE CONE-DISK TRANSMISSION

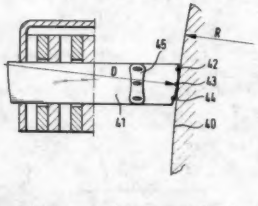
Manfred Rattunde, Bad Homburg, Fed. Rep. of Germany, assignor to Reimers Getriebe AG, Zug, Switzerland

Filed Dec. 3, 1985, Ser. No. 804,382

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447092

Int. Cl.⁴ F16H *55/56*

U.S. Cl. 474—8 **10 Claims**



1. Infinitely variable cone disk transmission having two pairs of cone disks (24, 25; 26, 27), in which the cone disks of the pairs are formed with mutually facing engagement faces, which engagement faces are, at least approximately, part spherically curved about a curvature radius, and in a diagonal relationship one cone disk of the disks of each pair is axially shiftable, the other cone disk of the disks of the pair being fixed;

a transmission chain (9) looped between the cone disk pairs, having link elements formed with outwardly curved lateral contact surfaces, contacting the mutually facing engagement faces of the cone disks of the pairs, and transferring rotary power by frictional engagement with said faces, between the pairs of disks,

wherein, in accordance with the invention,

the radius of curvature R of the at least in part spherical engagement surfaces at any point of engagement with the curved contact surfaces of the chain link elements is greater than a theoretical radius of curvature r,

which theoretical radius of curvature results when the distance of axial movement of the movable cone disk of one of the pairs is equal to the distance of axial movement of the movable cone disk of the other of the pairs upon change of transmission ratio—within the range of transmission ratios of the transmission-while maintaining torque transmitting engagement with the outwardly curved contact surfaces of the link elements; and

wherein the radius D of curvature of the contact surfaces of the link elements is greater than half the width of the link elements, measured transversely to the running direction of the chain, when looped between said pairs of cone disks.

4,631,043

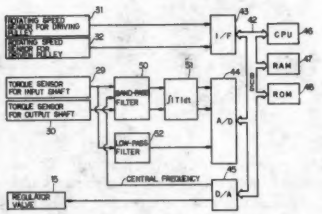
HYDRAULIC CONTROL APPARATUS FOR A CONTINUOUSLY VARIABLE TRANSMISSION

Setsuo Tokoro; Takashi Shigematsu, and Tomoyuki Watanabe, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 3, 1984, Ser. No. 606,467

Int. Cl.⁴ F16H *11/06*

U.S. Cl. 474—18 **31 Claims**



1. A hydraulic control apparatus for controlling a RPM of an engine in a motor vehicle using a continuously variable transmission, the transmission having a driving pulley mounted in an input shaft, the driving pulley comprising a fixed member and a movable member, the movable member being actuated by a hydraulic cylinder to form a V-shaped opening between the movable member and the fixed member, a driven pulley mounted on an output shaft, the driven pulley comprising another fixed member and another movable member, the another movable member being similarly actuated by another hydraulic cylinder supplied with a line pressure to form another V-shaped opening between said another movable member and said another fixed member and an endless belt member spanning the pulleys so that an effective diameter of the pulleys can be varied with regard to each other so that different speed ratios can be obtained, comprising:

a first torque sensing means for detecting an input torque on the input shaft of the driving pulley generated by the power stroke of the engine and for outputting an input torque signal, said first torque sensing means being in communication with said input shaft;

a second torque sensing means for detecting an output torque on the output shaft of the driven pulley generated by the power stroke of the engine and for outputting an output torque signal, said second torque sensing means being in communication with said output shaft;

a control circuit including:

a first calculating means for receiving the input and output torque signals and for calculating a first actual ratio between the output torque of the ouput shaft detected by the second torque sensing means and the input torque of the input shaft detected by the first torque sensing means, the first calculating means outputting at least a first calculated signal having a first value and a second calculated signal having a second value, said first calculating means outputting the second calculated

signal a predetermined time period after outputting the first calculated signal;

a second calculating means for receiving the first and second calculated signals from the first calculating means and calculating a second actual ratio between the first value of the first calculated signal and the second value of the second calculated signal, the second calculating means outputting a third calculated signal, the third calculated signal being indicative of the second actual ratio;

a memory means for receiving said first and second calculated signals and for storing a predetermined ratio between the output torque of the output shaft and the input torque of the input shaft;

a comparison means for comparing the stored predetermined ratio with said second actual ratio of the third calculated signal, the comparison means outputting a comparison signal indicative of a result of the comparison; and

hydraulic fluid control means for receiving said comparison signal and for controlling the line pressure supplied to said another hydraulic cylinder of the driven pulley in accordance with said comparison signal, whereby said control means increases the line pressure to obtain said predetermined ratio when said second actual ratio is less than the predetermined ratio, and decreases the line pressure to obtain said predetermined ratio when said second actual ratio is greater than the predetermined ratio.

4,631,044

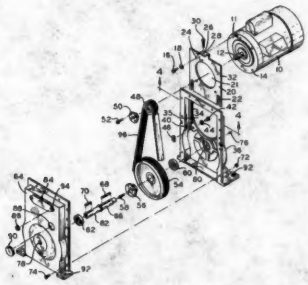
SPEED CHANGING DEVICE

Larry Redmon, Fort Wayne, Ind., assignor to Challenge Tool & Manufacturing, Inc., New Haven, Ind.

Filed Oct. 7, 1985, Ser. No. 785,068

Int. Cl.[4] F16H *7/14*

U.S. Cl. 474—114 **11 Claims**



1. A speed changer for changing the rotational output speed of a motor comprising:

a motor mounting plate adapted to receive a motor thereupon, said plate having an aperture through which passes the motor output shaft;

a housing having two generally parallel guide grooves for slidably receiving said motor mounting plate and an aperture between said grooves through which passes said motor output shaft;

a driver pulley adapted to be concentrically mounted upon said motor output shaft;

a speed changer output shaft rotatably mounted upon said housing;

a driven pulley different in diameter than said driver pulley concentrically mounted upon said speed changer output shaft;

an endless member rotatably coupling together said driver and driven pulleys; and

a screw means, connected to said mounting plate, for slidably adjusting said mounting plate within said grooves so as to provide tension to said drive belt.

4,631,045

APPARATUS FOR PRODUCING A ROD-LIKE SMOKING ARTICLE WITH SECONDARY AIR CHANNELS

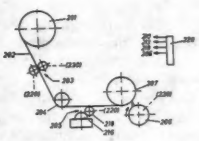
Antonio P. A. Frattolillo, Boudry, Switzerland, assignor to Fabriques de Tabac Reunies, S.A., Neuchatel, Switzerland

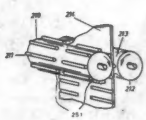
Continuation of Ser. No. 744,804, Jun. 14, 1985, abandoned, which is a continuation of Ser. No. 644,073, Aug. 24, 1984, abandoned, which is a division of Ser. No. 348,571, Feb. 12, 1982, Pat. No. 4,498,487. This application Dec. 27, 1985, Ser. No. 815,116

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1981, 3105456

Int. Cl.[4] B31C *13/00*

U.S. Cl. 493—46 **4 Claims**





1. Apparatus for producing a rod-like smoking article wherein a double-length mouthpiece core with coaxially extending tobacco rods at either end is circumscribed by a preglued wrapping strip portion over the entire length of the double-length mouthpiece core and over adjacent portions of the two tobacco rods, said wrapping strips having an overlap region when wrapped about said core and said rods, an inside surface for contracting said core and said rods, and an outside surface, said apparatus comprising:

a reel for carrying a double-width wrapping paper strip;

means for receiving said strip from said reel and for stamping notches exclusively into said inside surface for producing a unitary strip having one smooth surface and one notched surface;

glueing means for receiving said unitary strip from said stamping means and for coating said inside surface with glue except in the notches; and

means synchronized with said stamping means for receiving said glued strip from said glueing means and for cutting said glued strip into portions.

4,631,046

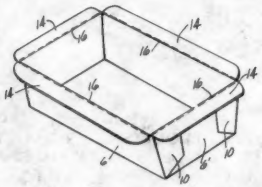
BAKE IN TRAY AND METHOD OF FORMING A BLANK FOR THE SAME

Kenneth V. Kennedy, Little Canada, Minn., assignor to Waldorf Corporation, St. Paul, Minn.

Continuation of Ser. No. 628,584, Aug. 23, 1984, abandoned, which is a division of Ser. No. 540,107, Oct. 11, 1983, abandoned, which is a continuation of Ser. No. 347,711, Feb. 10, 1982, abandoned. This application Feb. 19, 1985, Ser. No. 703,184

Int. Cl.[4] B31B *3/20, 9/26;* B32B *23/08*

U.S. Cl. 493—59 2 Claims



1. A method of forming a blank from which a paperboard microwave cooking tray can be erected, said method comprising the steps of:

(a) providing a supply of stock paperboard one side of which is coated with a moisture resistant styrene methyl methacrylate copolymer coating;

(b) forming a plurality of score lines on said coated paperboard thereby defining a bottom wall and four side walls connected to said bottom wall by said score lines;

(c) simultaneously with the formation of said plurality of score lines, forming a plurality of interrupted cut score fold lines thereby defining foldable connections and a plurality of flanges which are foldably connected to said side walls, the cuts of said interrupted cut score lines passing through the paperboard as well as its coating; and

(d) simultaneously with the formation of said plurality of score lines and the formation of said plurality of interrupted cut score fold lines, cutting said coated paperboard to form the periphery of said blank and separate said blank from said supply of stock paperboard.

4,631,047

APPARATUS FOR CUTTING HAND HOLES IN BAGS

Karl Dreckmann, Hennef-Altenbödingen, and Theo Miesen, Niederkassel-Rheidt, both of Fed. Rep. of Germany, assignors to Lemo M Lehmacher & Sohn GmbH Maschinenfabrik, Niederkassel, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,890

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1984, 3445660

Int. Cl.[4] B31B *1/20;* B26F *1/44*

U.S. Cl. 493—227 5 Claims

1. An apparatus for forming aligned front and rear hand holes in the front and rear panels of a bag, the apparatus comprising:

a support having a front face and an oppositely directed rear face adapted to respectively support the front and rear panels of the bag and formed with respective aligned front and rear annular recesses of a shape corresponding to that of the hand holes to be cut;

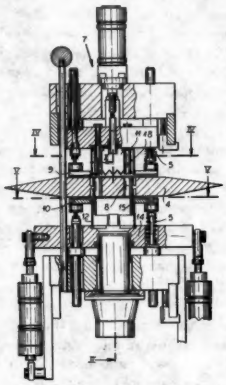
respective annular front and rear outer holddowns engageable with the respective faces for pressing the respective panels thereagainst around the respective recesses;

an annularly continuous front cutter blade engageable in the front recess;

an annular but discontinuous rear cutter blade engageable in the rear recess;

a rear inner holddown engageable with the rear face within the recess; and

actuator means for pressing the holddowns against the respective faces and for simultaneously pressing the blades into the respective recesses and thereby cutting a piece



from the front panel and forming an annular but discontinuous cut in the rear panel.

4,631,048

METHOD AND APPARATUS FOR PNEUMATICALLY EVACUATING CENTRIFUGES

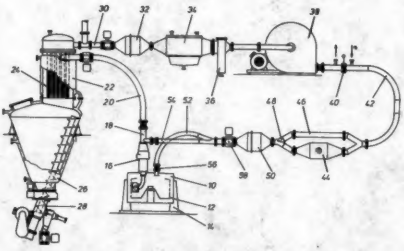
Hans-Joachim Titus, Dornach, Fed. Rep. of Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 18, 1984, Ser. No. 662,020

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1983, 3340636

Int. Cl.[4] B04B *15/02*

U.S. Cl. 494—13 13 Claims



1. A method for evacuating centrifuges, wherein the centrifuged product being peeled from the wall of a rotating centrifuging drum is fed to a discharge pipe passing through a closed centrifuge housing, comprising the steps of:

providing a primary flow of heated drying gas and a secondary flow of heated drying gas;

feeding said primary flow into the centrifuge housing as carrier fluid for conveying said product into said discharge pipe;

transforming said secondary flow of drying gas into a turbulent longitudinal flow essentially concentrically enclosing said discharge pipe adjacent a downstream end portion thereof;

and uniting said mixture of product and heating gas of the primary flow conveyed through said discharged pipe with said turbulent flow along a tubular product drying distance.

4,631,049

CENTRIFUGE FOR CLARIFYING OR SEPARATING SUSPENSIONS

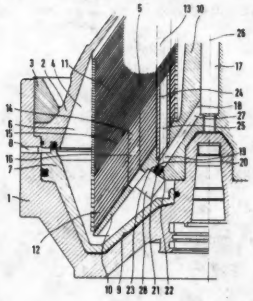
Karl H. Zettier, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Jun. 17, 1985, Ser. No. 745,772

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1984, 3426479

Int. Cl.[4] B04B *1/08*

U.S. Cl. 494—71 **6 Claims**



1. In a centrifuge for clarifying or separating suspensions and having a centrifuge drum with a bottom, a lid, an annular seal uniting the bottom and lid, an access chamber for a the suspension, and a distributor past which suspension is supplied to a package of conical plates provided with inner ascending channels, the improvement comprising: a diversion chamber disposed below each inner ascending channel and in communication with the access chamber, wherein each diversion chamber has means forming at least one calibrated aperture for separating off part of the suspension with its solids; wherein the package of plates comprises an upper section and a lower section, with the lower section having outer ascending channels, which are positioned radially farther out than the inner ascending channels and to which the separated portion of the flowing suspension is supplied; and pipe connections extending from the diversion chamber to the inner ascending channels in the upper section of the plate package and supplying the remainder of the flowing suspension to the inner ascending channels.

4,631,050

AUTOTRANSFUSION SYSTEM AND METHOD

Charles C. Reed, Rte. 3, Box 803, Conway, Ark. 72032, and Denton A. Cooley, 3014 Del Monte, Houston, Tex. 77019

Filed Sep. 24, 1985, Ser. No. 779,497

Int. Cl.[4] A61M *1/03*

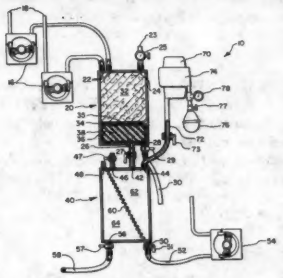
U.S. Cl. 604—4 **34 Claims**

1. A continuous blood filtering, washing, and concentrating apparatus comprising:

a filtration unit having both an inlet port for continuously receiving a mixture of healthy blood cells, fluid, and particulate debris, and a first outlet port, said filtration unit being capable of removing at least a portion of the particulate debris from the mixture;

means for removing at least a portion of the fluid from the mixture, said fluid-removing means having a receiving chamber which is in communication with the first outlet port of the filtration unit, said fluid-removing means having a semipermeable membrane which is at least partially bounded by the receiving chamber;

means for selectively pressurizing the receiving chamber of the fluid-removing means such that at least a portion of the fluid of the mixture is forced through the semipermeable membrane under pressure and out of the receiving chamber while the healthy blood cells are retained by the membrane within the receiving chamber; and



means, communicating with the receiving chamber of the fluid-removing means, for selectively injecting a washing solution into the receiving chamber of the fluid-removing means.

4,631,051

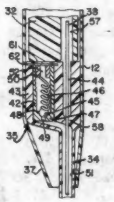
VENTRICULAR AMNIOTIC SHUNT AND INTRODUCER SYSTEM

Donald L. Harris, Key Largo, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Sep. 24, 1984, Ser. No. 653,340

Int. Cl.[4] A61M *27/00, 25/00*

U.S. Cl. 604—9 **26 Claims**



1. A ventricular amniotic shunt and introducer system for the relief of fetal hydrocephalus, comprising:

an introducer assembly including a guiding assembly having a longitudinal lumen therethrough;

a pushing tool of said introducer assembly, said pushing tool including an elongated rod insertable through said longitudinal lumen of the introducer assembly, said pushing tool having a distal end, and said pushing tool including a stylet slidable through a lumen of said pushing tool elongated rod;

a valve assembly inserted through said longitudinal lumen of the introducer assembly and inclining a hydrocephalus valve mounted within a valve housing and a catheter depending from said valve housing, said valve having an inflow end and an outflow end, said catheter having a distal end, said catheter and said valve inflow end housing having a common passageway between the hydrocephalus valve and the distal end of the catheter, said valve assembly having a top end, and said valve housing includes a stylet guiding partial lumen longitudinally positioned therewith and spaced from said common passageway;

the distal end of the pushing tool pushingly engages the top end of the valve assembly; and

an orifice is included at the distal end of the catheter, and an opening in said top end of the valve assembly is in fluid-

passing communication with the outflow end of the hydrocephalus valve, said orifice being in fluid-passing communication with the inflow end of the hydrocephalus valve through said common passageway.

4,631,052

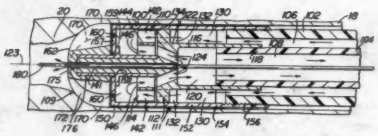
METHOD AND APPARATUS FOR SURGICALLY REMOVING REMOTE DEPOSITS

Kenneth R. Kensey, Hinsdale, Ill., assignor to Intravascular Surgical Instruments, Inc., Frazer, Pa.

Continuation-in-part of Ser. No. 567,506, Jan. 3, 1984, Pat. No. 4,589,412. This application Dec. 17, 1984, Ser. No. 682,393

Int. Cl.⁴ A61B *17/32*

U.S. Cl. 604—22 **12 Claims**



1. An apparatus for opening a restriction formed of material inside of a passageway within a living being, said apparatus comprising: a flexible catheter having a longitudinal axis and a distal portion including fluid-driven, movable working means located at said distal portion, fluid delivery means for providing a fluid under pressure to said working means for rotating said working means about said axis and with respect to said material while said working means is advanced into said material to open said restriction, and constraining means for constraining a substantial portion of said fluid within said catheter to preclude the egress of said substantial portion of said fluid into the location of said restriction while enabling a minor portion of said fluid to gain ingress into said passageway adjacent said working means.

4,631,053

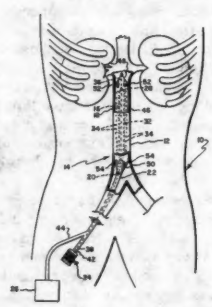
OXYGENATOR

Syde A. Taheri, 268 Dan Troy Dr., Williamsville, N.Y. 14221

Filed Mar. 19, 1984, Ser. No. 590,701

Int. Cl.⁴ A61M *3/00*

U.S. Cl. 604—49 **10 Claims**



1. An oxygenator capable of oxygenating blood within a patient's body comprising:

an elongated wire support of such length that one end portion of the support may be disposed within a patient's body at the location where blood is to be oxygenated with the other end portion of the support being disposed outside the patient's body;

an elongated hollow membrane formed of a gas permeable material and capable of being twisted to a collapsed condition, said membrane being closed at one end and open at the other end, the closed end being secured to said one end portion of said wire, said wire supporting said hollow membrane during insertion into a patient's body, said membrane being fully inserted within the patient's body during oxygenation; and

tubular means having one end portion connected to the open end of said hollow membrane, and other end portion connectible to an oxygen supply when the hollow membrane is disposed within the patient's body whereby oxygen may be introduced into said membrane through said tubular means, a portion of said wire support passing through said tubular means.

4,631,054

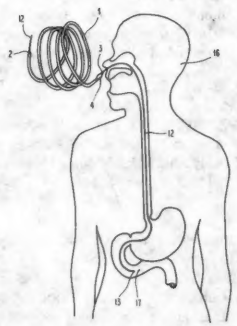
APPARATUS AND PROCESS FOR NASO-INTESTINAL INTUBATION

Il G. Kim, N. Main St., Hughesville, Pa. 17737

Filed Nov. 16, 1984, Ser. No. 672,361

Int. Cl.⁴ A61M *25/00*

U.S. Cl. 604—54 **10 Claims**



1. An edoscopic guided naso-intestinal tube in combination with a guide wire comprising

a. a tubular member having two ends and

b. a diameter accommodatingly larger than said guide wire;

b. a mercury bas circumferentially mounted adjacent to the first end of said tubular member;

c. means for connecting the tubular member to other instruments, said means mounted on the second end of the tubular member;

d. a series of drainage ports defined in the wall of said tubu-

lar member to provide communication between the inside and outside of said tubular member located along the length of said tubular member; and

e. means for injecting mercury into said mercury bag.

6. A method for intubation of the duodenum of a human patient comprising

a. anesthetism of the patient's throat and nostrils;

b. intubation through the oral cavity of a flexible gastro duodenoscope, comprising a biopsy port, Into the second portion of the duodenum;

c. introduction of a flexible guide wire of at least about twelve (12) feet in length through said biopsy port into the second portion of the duodenum to a given position;

d. removal of said duodenoscope;

e. marking of the wire position on said wire;

f. insertion of a lubricated tube through the nostril into the oral cavity;

g. withdrawal of one end of said tube through the mouth;

h. sliding the guide wire through said tube until it exits the nasal cavity end;

i. removal of said tube;

j. introduction of a naso-intestinal tube over said guide wire in a sliding fashion until the desired level is reached wherein said naso-intestinal tube comprises

(1) a tubular member having two ends and a diameter accommodatingly larger than a guide wire

(2) a mercury bag circumferentially mounted adjacent to the first end of said tubular member

(3) means for connecting the tubular member to other instruments said means mounted on the second end of the tubular member

(4) a series of drainage ports defined in the wall of said tubular member to provide communication between the inside and outside of said tubular member located along the length of said tubular member; and

k. removal of the guide wire thereby completing the intubation.

4,631,055

APPARATUS FOR APPLYING A TISSUE ADHESIVE

Heinz Redl, and Georg Habison, both of Vienna, Austria, assignors to Immuno Aktiengesellschaft fur chemisch-medizinische Produkte, Vienna, Austria

Filed Feb. 26, 1985, Ser. No. 705,725

Claims priority, application Austria, Mar. 29, 1984, 1063/84

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—82 **2 Claims**

1. In an apparatus for applying a tissue adhesive based on human or animal proteins to be used for seamlessly or seam-supportingly connecting human or animal tissue or organ parts, for sealing wounds, stopping bleedings and the like, said tissue adhesive being formed in situ by bringing together at least two components comprised of solutions of said proteins and blood clot-promoting coagulation factors, said apparatus comprising a plurality of disposable syringe bodies made of synthetic material and adapted to contain said components, said bodies including coni through which the components are to be expelled, a connecting head attachable to said coni, and separate component-conveying channels disposed in said connecting head for conducting said components to be applied, the improvement wherein a gas-conveying channel is provided in said connecting head for conducting a medicinal gas, said gas-conveying channel extending to a front side of said connecting head to discharge gas in a direction parallel to the discharge of said components from said component-conveying channels and closely adjacent thereto, a multi-lumen catheter formed of one-piece integral construction with said connecting head and including a plurality of component-conveying lumina communicating with respective ones of said component conveying channels, and a gas-conveying lumen communicating with said gas-conveying channel, whereby said syringes can be removed from said connecting head and integral catheter for replacement.

4,631,056

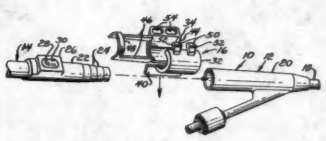
TAMPER DISCOURAGING SYSTEM

John F. Dye, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jul. 12, 1984, Ser. No. 630,174

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—111 **8 Claims**



1. A tamper discouraging system, comprising:

a catheter having an elongated shaft and a hollow connector at a proximal end of the shaft;

a drainage tube having an adapter at an upstream end of the drainage tube, with said adapter being received in the connector;

a first semi-annular shell for placement over the connector;

a second semi-annular shell for placement over the connector;

hinge means connecting one end of the first shell to one end of the second shell; and

means for locking the other end of the first shell to the other end of the second shell, wherein the hinge means comprises a spaced pair of lines of weakness adjacent the one end of the first and second shells, and including an outwardly directed tab intermediate the lines of weakness to rupture the hinge means.

4,631,057

SHIELDED NEEDLE

Charles B. Mitchell, Greenville, S.C., assignor to Dolores A. Smith; Norma A. Sampson and Earl W. Sampson, all of Fullerton, Calif., a part interest to each

Filed Dec. 17, 1985, Ser. No. 809,277

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—198 **9 Claims**

1. An apparatus for injecting a substance into a human or animal comprising:

a body adapted to contain the substance to be injected;

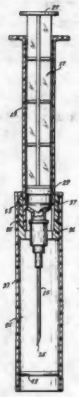
means for mounting a hypodermic needle on the body with the needle having a passage extending therethrough and terminating in a point whereby the substance can pass from the body to and through the passage of the needle;

a collar carried by said body;

a needle guard;

the needle guard being mounted on the body for movement

relative to said body and over said collar from a retracted position in which the needle guard does not materially obstruct access to the point of the needle and an extended position in which the needle guard obstructs access to the point of the needle, said extended and retracted positions being axially spaced;



means for releasably retaining the needle guard in the retracted position; and

interlocking means on the needle guard and the collar responsive to movement of the needle guard to the extended position to lock the needle guard in the extended position.

4,631,058

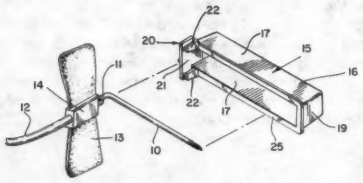
GUARD FOR RIGHT ANGLE WINGED INFUSION NEEDLE

Kenneth C. Raines, Bethlehem, Pa., assignor to Burron Medical, Inc., Bethlehem, Pa.

Filed Jun. 24, 1985, Ser. No. 747,569

Int. Cl.[4] A61M *5/325*

U.S. Cl. 604—263 **5 Claims**



5. A guard for a right angle winged infusion needle comprising

an elongated approximately rectangular body which is open along one side and including opposite side longitudinal walls, a back longitudinal wall and a pair of end walls,

a marginal flange on said body adjacent to its open side and being contiguous with said longitudinal side walls and one end wall and projecting outwardly of such walls approximately perpendicular thereto, and

a clip attachment on said body substantially at one end thereof and extending outwardly from the open side of the body and away from said back wall, the clip attachment including a clip wall which is contiguous with one end wall of the body and forms substantially a continuation thereof, the clip wall projecting somewhat laterally outwardly of the longitudinal side walls of the body and being joined with said marginal flange and having spaced gripping elements formed on one face thereof, and the clip attachment further including a pair of spaced fingers united with said flange and being in spaced opposing substantially parallel relationship to the clip wall and also being in spaced opposing relationship to the gripping elements and being substantially coextensive lengthwise with the clip wall away from said flange and away from the open side of said body.

4,631,059

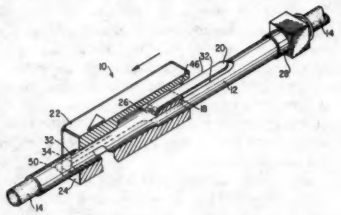
SHEATH REMOVER

Sidney Wolvek, Brooklyn, N.Y.; Walter Kaiser, Ramsey, and Kenneth Kaltenbach, Leonia, both of N.J., assignors to Datascope Corp., Oakland, N.J.

Filed Mar. 26, 1985, Ser. No. 716,259

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—280 **34 Claims**



1. Apparatus for removing a hollow, elongated, deformable introducer sheath from a position enclosing at least a portion of a catheter which has been inserted through the sheath with a close tolerance and introduced into a human body thereby, said apparatus comprising

cutting means,

guiding means carrying said cutting means for moving over said sheath along a selected portion of the length thereof, deforming means on said guiding means engaging the outside of said sheath for exerting pressure thereon in such a manner as to deform a part thereof away from said catheter at a point immediately adjacent to said cutting means and into contact with said cutting means to permit said cutting means to cut through said deformed part of said sheath while maintaining said catheter beyond the reach of said cutting means,

whereby said cutting means cuts said sheath in a lengthwise direction as the guiding means moves therealong for removal from said catheter while said catheter remains in place.

4,631,060

VAGINAL SPERMICIDE DISTRIBUTING MEMBRANE

Virgil A. Place, Half Moon Bay, Calif., assignor to Pavex, Inc., San Juan Capistrano, Calif.

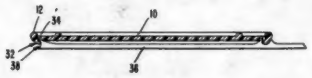
Continuation of Ser. No. 754,228, Jul. 12, 1985, abandoned, which is a division of Ser. No. 527,850, Aug. 30, 1983, abandoned, which is a continuation-in-part of Ser. No. 441,154, Nov. 12, 1982, abandoned. This application Jan. 10, 1986, Ser. No. 817,577

Int. Cl.[4] A61F *5/46*

U.S. Cl. 604—285 **20 Claims**

1. A process for making a vaginal spermicide distributing contraceptive device providing a physical barrier to the access of sperm to the cervical os and a support for the placement of spermicide when in use, comprising the step of molding a single piece of thermoplastic material into a generally planar flexible membrane having an integral thicker margin at the periphery thereof and at least one integral thicker rings dis-

posed within said thicker margin, said peripheral margin and said ring having sufficient resistance to deformation to provide



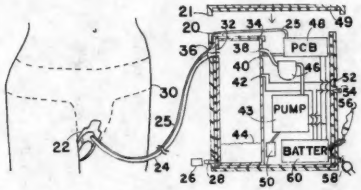
said membrane with a tendency to resume its planar configuration after being flexed.

4,631,061

AUTOMATIC URINE DETECTING, COLLECTING AND STORING DEVICE

Frank D. Martin, P.O. Box 72, Kerrville, Tex. 78028

Filed Jun. 19, 1984, Ser. No. 622,117
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—318 **17 Claims**



1. An automatic in-place urine detecting, collecting and storing device for urinary incontinent users to maintain relative dryness adjacent to a user's body, wherein the device comprises;

an elongated collection vessel approximately conforming to the user's urinary-genital area wherein the collection vessel comprises:

an interior collection surface lining the collection vessel;

a top edge which faces the user's body such that the interior collection surface surrounds the urinary-genital area upon putting the device on;

an interior perimeter of the interior collection surface adjacent to the top edge immediately adjacent to the user's body;

a resilient elevated lip which surrounds the top edge;

a flexible tube leading from the collection vessel to a separate temporary storage tank having a level sensing means and a rapid release valve to empty the tank;

a vacuum pump means for drawing the urine from the collection vessel through the flexible tube into the storage tank, wherein a one-way valve is positioned between the tube and the tank to prevent liquid flow from the tank into the tube, and wherein the vacuum draws the lip of the collection vessel into liquid tight contact with the body of the user;

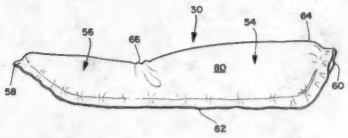
a multiplicity of droplet-sensitive liquid sensing means randomly located within the collection vessel which cover the interior collection surface of the collection vessel and cover the interior perimeter of the collection surface and can detect droplets of liquid when the device is in any spatial orientation which might cause urine to contact the body, wherein upon detecting liquid urine within the collection vessel, the liquid sensing means activates the vacuum pump to create a vacuum in the storage tank drawing the urine from the collection vessel to the storage tank until the sensor no longer detects liquid in the collection vessel leaving the collection vessel relatively dry.

4,631,062

LABIAL SANITARY PAD

Frederich O. Lassen, Winnebago County; Robert J. Peerenboom, and Cheri L. Schultz, both of Outagamie County, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 654,927, Sep. 27, 1984, abandoned, and a continuation-in-part of Ser. No. 612,506, May 21, 1984, abandoned. This application Mar. 1, 1985, Ser. No. 707,338
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 R **32 Claims**



1. An anatomically, generally self-conforming sanitary napkin configured for partial labial disposition within the vestibule of a wearer and for at least partially occluding said vestibule respecting fluid flow therefrom, said napkin comprising a fluid absorbent body having a posterior region including a raised profile for projection within said vestibule intermediate the labia majora inwardly bounding same from a position posteriorly remote from the clitoris and extending to the rearwardmost aspect of said vestibule, and an anterior region merging with said posterior region for a generally external disposition about the vulvar region over said labia majora and spaced from said clitoris.

4,631,063

PROCESS FOR FINISH DRESSING MINERALLY DRESSED LEATHERS OR THOSE DRESSED BY A COMBINED METHOD, USING POLYMER DRESSINGS

Dolf Stockhausen; Rudolf Nowak; Miroslav Chmelir; Manfred Kaussen, all of Krefeld, and Kurt Dahmen, Monchen-Gladbach, all of Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhausen GmbH, Krefeld, Fed. Rep. of Germany

Filed Apr. 8, 1985, Ser. No. 720,661

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1984, 3413301

Int. Cl.[4] C14C *5/00*

U.S. Cl. 8—94.21 9 Claims

1. A process for treating leathers which were previously treated by a mineral or combined method comprising contacting the leathers with an aqueous solution of a water soluble polymer derived from at least one monomer selected from the group consisting of an ethylenically unsaturated acrylic sulfonic acid, esters thereof, and an ethylenically unsaturated substituent containing aromatic sulfonic acid, salts thereof or mixtures thereof.

4,631,064

DEPILATORY COMPOSITIONS

Prem S. Juneja, Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Jun. 1, 1982, Ser. No. 383,432

Int. Cl.[4] A61K *7/155;* C14C *1/06*

U.S. Cl. 8—161 13 Claims

1. An aqueous depilatory composition comprising:

(a) from about 0.1M to about 2.0M of an active thiol agent; and

(b) from about 0.01M to about 2.0M of biguanide or its salts; wherein said composition has a pH of from about 10.5 to about 12.5 at 25° C.

4,631,065

REACTIVE DYES, PROCESS FOR THEIR PREPARATION AND USE THEREOF

Karl Seitz, Oberwil; Peter Scheibli, Bottmingen, and Herbert Seiler, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

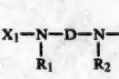
Continuation of Ser. No. 618,153, Jun. 7, 1984, abandoned. This application Aug. 20, 1985, Ser. No. 767,246

Claims priority, application Switzerland, Jun. 17, 1983, 3329/83

Int. Cl.[4] C09B *62/02;* D06P *3/66*

U.S. Cl. 8—549 13 Claims

1. A reactive dye of the formula



wherein D is the radical of a monoazo, polyazo, metal complex azo, anthraquinone, phthalocyanine, formazan, azomethine, dioxazine, phenazine, stilbene, triphenylmethane, xanthene, thioxanthone, nitroaryl, naphthoquinone, pyrenequinone, or perylenetetracarbimide dye; each of R_1 and R_2 independently is hydrogen or an unsubstituted or substituted C_1–C_4-alkyl radical; X_1 is an amino-fluoro-s-triazine radical in which the amino radical is —NH_2, alkylamino, N,N-dialkylamino, cycloalkylamino, N,N-dicycloalkylamino, aralkylamino, arylamio, N-alkyl-N-cyclohexylamino, N-alkyl-N-arylamino, an amino group which contains a heterocyclic radical which may contain further fused carbocyclic rings, or an amino group in which the amino nitrogen atom is a member of an N-heterocyclic ring which may contain further hetero atoms, the alkyl, cycloalkyl, aralkyl or aryl radicals, the heterocyclic radicals or the N-heterocyclic rings being unsubstituted or further substituted by halogen, nitro, cyano, trifluoromethyl, sulfamoyl, carbamoyl, C_1–C_4-alkyl, C_1–C_4-alkoxy, acylamino, ureido, hydroxy, carboxy, sulfomethyl or sulfo; and X_2 is a halotriazine or halospramidine or halopyradazine radical which is attached directly to the radical D through the —$N(R_2)$ bridge member, with the proviso that X_2 is not an unsubstituted or substituted aminofluoro-s-triazine radical.

4,631,066

METHOD FOR IMPROVING LIGHT-RESISTANCE OF AROMATIC POLYAMIDE FIBERS

Norihiro Minemura; Fumiki Takabayashi, both of Takatsuki, and Setsuo Yamada, Ibaraki, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jul. 18, 1984, Ser. No. 632,205

Claims priority, application Japan, Jul. 26, 1983, 58-135202; Mar. 30, 1984, 59-61122

Int. Cl.[4] D06M *13/28, 13/34*

U.S. Cl. 8—115.56 10 Claims

1. A method for improving the light-resistance of aromatic polyamide fibers, which comprises the steps of heat-treating aromatic polyamide fibers while in contact with a mixture of urea and thiourea in the range 80:20 to 20:80.

4,631,067

DISCHARGE PRINT PASTE AND METHOD OF USING SAME FOR THE DISCHARGE PRINTING OF SYNTHETIC TEXTILE MATERIALS

Samir Hussamy, Lynchberg, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Apr. 8, 1985, Ser. No. 720,736

Int. Cl.[4] D06P *5/15*

U.S. Cl. 8—464 16 Claims

1. An aqueous discharge print paste consisting essentially of:

a thickening agent;

lithium hydroxide;

an organic acid selected from the group consisting of ethanedioic acid, hydroxyacetic acid, propionic acid, butanedioic acid, butenedioic acid and mixtures thereof, said organic acid being present in an amount of from about 5 to about 10 parts by weight of the print paste;

a polyethylene glycol compound having a molecular weight between 400–800, said polyethylene glycol compound being present in an amount between about 5 to about 10 parts by weight of the print paste;

at least one polyoxyethylene sorbitan fatty acid ester wherein the residue of the fatty acid moiety thereof is derived from lauric acid, plamitic acid, stearic acid, or oleic acid, said at least one polyoxyethylene sorbitan fatty acid ester being present in amount between about 5 to about 10 parts by weight of the print paste; and

a polyalkylene glycol ether in an amount between about 3 to about 10 parts by weight of the print paste.

4,631,068

REMOVAL OF SULFUR FROM AQUEOUS SUSPENSION USING FILTRATION

Roy A. Baker; Rocky C. Costello, both of Houston, Tex., and Michael J. Engel, White Plains, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

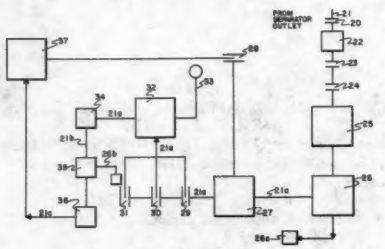
Filed Jul. 18, 1985, Ser. No. 756,156

Int. Cl.[4] C01B *17/027*

U.S. Cl. 23—293 S 12 Claims

1. A process for initiating the coalescence of sulfur from an

aqueous sulfur-containing suspension above the melting point of sulfur which comprises passing said sulfur-containing aqueous suspension through at least one filter means comprised of a multi-passage filter material to initiate the coalescence.



4,631,069

ANTI-WEAR ADDITIVES FOR ALCOHOL FUELS

Rodney L. Sung, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 20, 1985, Ser. No. 746,816
Int. Cl.⁴ C10L *1/22*
U.S. Cl. 44—56 **16 Claims**

1. A fuel composition for an internal combustion engine comprising:

(a) a major portion of a fuel containing (i) a C_1–C_2 alcohol and (ii) 0–50 volumes of gasoline per volume of alcohol; and

(b) from about 0.003 to about 10.0 (w)% of, as a wear-inhibiting additive, a condensate product of the process comprising:

(i) reacting a dibasic acid anhydride with a polyoxyisopropylenediamine

$$NH_2—\underset{\displaystyle CH_3}{\underset{|}{CH}}—CH_2—(OCH_2\underset{\displaystyle CH_3}{\underset{|}{CH}})_x—NH_2$$

where x is a numeral of about 2 to about 68 at 75° to 150° C. for 2 to 4 hours, thereby forming a maleamic acid;

(ii) reacting said maleamic acid with an N-alkyl-alkylene diamine at about 60° to 100° C. for about 0.1 to 10.0 hours, thereby forming a condensate product; and

(iii) recovering said condensate product.

4,631,070

GLYCIDOL MODIFIED SUCCINIMIDES AND FUEL COMPOSITIONS CONTAINING THE SAME

Frank Plavac, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 673,962, Nov. 21, 1984. This application Jun. 3, 1986, Ser. No. 870,066
Int. Cl.⁴ C10L *1/18, 1/22*
U.S. Cl. 44—63 **19 Claims**

1. A fuel composition comprising a hydrocarbon boiling in the gasoline range and from 10 to 10,000 parts per million of a product produced by the process which comprises contacting at a temperature sufficient to cause reaction an alkenyl or alkyl succinimide containing at least one primary or secondary amine with glycidol wherein the charge mole ratio ranges from greater than 1 and up to 10 of glycidol to each of the basic nitrogens of the alkenyl or alkyl succinimide.

4,631,071

COLD FLOW IMPROVING FUEL ADDITIVE COMPOUND AND FUEL COMPOSITION CONTAINING SAME

Joan C. Axelrod, Media, Pa., and Sheldon Chibnik, Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 18, 1985, Ser. No. 810,115
Int. Cl.⁴ C10L *1/22*
U.S. Cl. 44—71 **32 Claims**

1. A product of reaction useful for improving the low temperature characteristics of hydrocarbyl distillate fuels produced from the reaction of (1) a branched chain monocarboxylic acid ester having at least one tertiary amine group and at least one branched chain acid ester group, (2) an epoxide having from 2 to about 18 carbon atoms and (3) additional carboxylic acid selected from branched chain monocarboxylic acids and linear monocarboxylic acids and wherein said reactants are reacted in substantially stoichiometric or equimolar amounts at temperatures ranging from about 50° to about 175° C. under autogenous pressure in 0.5 to about 3 hours or more.

4,631,072

MIXTURE FOR THE CARE AND CLEANING OF CONTACT LENSES

Anton Koller, Operngasse 23, 1040 Wien, Austria

Filed Dec. 9, 1985, Ser. No. 806,975
Claims priority, application Austria, Dec. 10, 1984, 3910/84
Int. Cl.⁴ B24D *3/06*; C09C *1/04*
U.S. Cl. 51—309 **8 Claims**

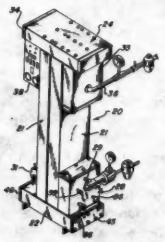
1. Mixture for the care and cleaning of contact lenses, containing water, an abrasive which is at least one metal oxide having a grain size smaller than 10 μm, and a suspension aid, the ratio of abrasive to water in the mixture ranging between 1:99 and 90:10, the abrasive being at least one member selected from the group consisting of zinc oxide and tin oxide.

4,631,073

METHOD AND APPARATUS FOR THEADSORPTIVE FRACTIONATION OF GASES

Robert A. Null; Lonnie C. Laughlin, both of Littleton, and Michael L. Goldberg, Breckenridge, all of Colo., assignors to Wilkerson Corporation, Englewood, Colo.

Continuation of Ser. No. 590,348, Mar. 16, 1984, abandoned, which is a continuation of Ser. No. 590,013, Mar. 15, 1984, Pat. No. 4,559,065. This application Jul. 5, 1985, Ser. No. 752,098
Int. Cl.⁴ B01D *53/04*
U.S. Cl. 55—18 **25 Claims**



1. A method of controlling gas flow for the adsorptive fractionation of gases in a twin tower gas fractionation apparatus including a generally elongated prism shaped tower of heat conductive material integrally defining first and second parallel tower bores extending axially longitudinally through said tower, said first and second tower bores containing first and second sorbent beds respectively, an input manifold sealingly secured to said tower at one end thereof, an output manifold sealingly secured to said tower at the other end thereof, the tower bores extending between the input and output manifolds,

each of said manifolds being formed as an elongated prism, means in each said manifold defining first and second parallel manifold bores extending therein, means in each manifold for communicating the first and second manifold bores with the corresponding first and second tower bores respectively, said inlet manifold including in communication with each manifold bore an inlet gas port for receiving a gaseous mixture to be fractionated and an outlet port for discharging purge gas to regenerate or purge the sorbent bed in the corresponding tower bore, and said outlet manifold including in communication with each manifold bore an outlet gas port for discharging fractionated gas and a restricted orifice opening extending between said first and second outlet manifold bores for introducing purge gas from said stream of fractionated gas in one outlet manifold bore to the other outlet manifold bore, an inlet gas control assembly comprising an inlet housing mounted on said inlet manifold in operative alignment with said inlet gas ports, a shuttle valve in said inlet housing including first and second shuttle valve members operatively positioned for selectively opening and closing said first and second inlet gas ports respectively in response to a relative predetermined pressure differential in the first and second inlet manifold bores, an outlet gas control assembly including an outlet housing mounted on said outlet manifold in operative alignment with said outlet gas ports, a check valve operatively positioned in said outlet housing for controlling the fractionated gas flow from the associated outlet gas port in relation to the pressure at the outlet gas port, and first and second pilot controlled purge valves operatively mounted on said inlet manifold in communication with the outlet port of said first and second inlet manifold bores respectively; said method comprising the steps of directing a flow of the pressurized gaseous mixture to be fractionated containing a component to be adsorbed from a source thereof to said shuttle valve, withdrawing a major flow of pressurized gas lower in said adsorbable component from one outlet gas port of said outlet housing while conducting a minor flow of said gas lower in said adsorbable component at a predetermined lower pressure as a purge gas through the restricted orifice opening from the one bore to the other bore of said outlet manifold, the pressure of the major flow of pressurized gas in the one bore of the outlet manifold corresponding to the sorbent bed receiving the flow of pressurized gaseous mixture being sufficient to open the check valve operatively associated with the one outlet gas port of the one bore, the predetermined lower pressure of the minor flow of gas conducted by the restricted orifice opening to the other bore of the outlet manifold being insufficient to open the check valve operatively associated with the outlet gas port of the other bore, opening the first one of said purge valves for exhausting purge gas from the corresponding first of said sorbent beds, the opening of said first purge valve effecting a pressure reduction in said first corresponding sorbent bed and in the first manifold bore associated therewith, said pressure reduction causing said shuttle valve to shift to close the corresponding inlet port to said first inlet manifold bore and simultaneously open the inlet port to the second inlet manifold bore to direct the flow of pressurized gaseous mixture to the second sorbent bed wherein said adsorbable gas component is at least partially removed from the gaseous mixture, closing said first purge valve after a first purge time sufficient to purge said first one of said sorbent beds of the adsorbed gas component, flowing pressurized gas through said second one of said sorbent beds for a first adsorbing time period at least equal to said first purge time but not exceeding the time period in which said second sorbent bed would become saturated with said adsorbable gas component, and at the end of said first adsorbing time period opening the second one of said purge valves to exhaust purge gas from said second sorbent bed and simultaneously effect a pressure reduction in the second inlet manifold bore and in the corresponding second sorbent bed, the pressure reduction causing said shuttle valve to shift to close said second corresponding inlet gas port and open the first inlet gas port corresponding to said first inlet manifold and first sorbent bed to direct the pressurized gaseous mixture thereto wherein said adsorbable gas component is at least partially removed from the gaseous mixture, and continuously repeating said steps to alternately shift said sorbent beds from adsorption to purge by directly controlling the opening and closing of substantially only the first and second purge valves, thereby to provide for the continuous adsorption of said adsorbable gas component from said pressurized gas.

8. In an apparatus for adsorptive fractionation of a gaseous mixture, including at least a pair of sorbent beds, means for directing a flow of the gaseous mixture from a source thereof to one of the beds for removing a gaseous component of said mixture while simultaneously directing a flow of purge gas through the other of said beds for stripping the adsorbed gas component thereform, and means for controlling the flow of said gases to and from said beds, the improvement comprising, a generally elongated prism shaped tower of heat conductive material, and means integrally in said tower prism defining a pair of parallel tower bores extending axially longitudinally through said tower, and said tower bores being adapted each to contain a sorbent bed, an input manifold sealingly secured to said tower at one end thereof, an output manifold sealingly secured to said tower at the other end thereof, the tower bores extending between the input and output manifolds, esch of said manifolds being formed as a one-piece elongated prism, means integrally in each said manifold defining a pair of parallel longitudinally extending manifold bores, means in each manifold defining a communication port for communicating each manifold bore with a different one of said tower bores, said inlet manifold including inlet gas ports for receiving a gaseous mixture to be fractionated and outlet ports for discharging purge gas, said outlet manifold including outlet gas ports for discharging fractionated gas, and said tower prism and said inlet and outlet manifolds having essentially the same cross-sectional configuration taken transverse to the bores therethrough.

4,631,074

METHOD AND APPARATUS FOR REDUCING THE TEMPERATURE OF AIR

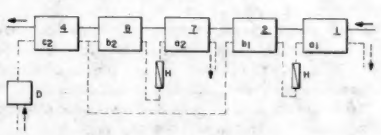
Axel Eschner, Wiesbaden, Fed. Rep. of Germany, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Nov. 30, 1982, Ser. No. 445,474

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1981, 3149672

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—27 **6 Claims**



1. A method of reducing the temperature of humid environmental air, said method comprising:

providing in series connection a first moisture storage agent, a first heat storage agent, a second moisture storage agent and a second heat storage agent;

passing said air serially through said agents and thereby:

passing said air through said first moisture storage agent and therein substantially reducing the moisture content of said air;

passing said air through said first heat storage agent and therein lowering the temperature of said air without changing the humidity thereof;

passing said air through said second moisture storage agent and therein substantially freeing said air of the remaining moisture content thereof; and

passing said air through said second heat storage agent and therein further lowering the temperature of said air without changing the humidity thereof; and

then passing said air through a water saturated moisture

storage agent and therein increasing the moisture content of said air and further lowering the temperature thereof.

4. An apparatus for reducing the temperature of humid environmental air and for use with a blower and piping system for conveying the air, said apparatus comprising:

a first moisture storage agent for receiving humid environmental air and for substantially reducing the moisture content thereof;

a first heat storage agent for receiving said air from said first moisture storage agent and for lowering the temperature of said air without changing the humidity thereof;

a second moisture storage agent for receiving said air from said first heat storage agent and for substantially freeing said air of the remaining moisture content thereof;

a second heat storage agent for receiving said air from said second moisture storage agent and for further lowering the temperature of said air without changing the humidity thereof; and

a water saturated moisture storage agent for receiving said air from said second heat storage agent and for increasing the moisture content of said air and further lowering the temperature thereof.

4,631,075

COMPOSITE MEMBRANE FOR GAS SEPARATION

Masaaki Yamabe, Machida; Shigeyoshi Kobayashi, Kawasaki; Noriyuki Yoshihara, Yokohama, and Masaru Nakamura, Setagaya, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,334

Claims priority, application Japan, Apr. 26, 1983, 58-72210

Int. Cl.[4] B01D *53/22*

U.S. Cl. 55—158 **9 Claims**

1. A composite membrane for gas separation having a three-layered structure comprising:

(A) a porous polymer supporting membrane layer having a cross-sectional oxygen permeation flux of at least 5 $m^3/m^2.hr.atm$ (STP) and having a porous structure such that the average pore diameter at one surface is from 5 to 500 Å and the average pore diameter at the other surface is greater than that at said one surface;

(B) a polyorganosiloxane layer having a thickness of from 300 Å to 5 μm; and

(C) a thin layer having a thickness of from 100 to 5000 Å and made of a polymer containing monomer units of at least one monomer selected from the group consisting of fluoroolefin monomers and pivalate

$$(-OCC(CH_3)_3)$$
$$\|$$
$$O$$

group-containing monomers, being soluble in an organic solvent and having an O_2/N_2 permeability coefficient ratio of at least 3.5;

said layer B contacting said one surface with the smaller pore diameter of the layer A, said layer C contacting the surface of the layer B, and the composite membrane having an oxygen permeation flux of at least 0.1 $m^3/m^2.hr.atm$ (STP) and a O_2/N_2 permeation flux ratio of at least 2.5.

4,631,076

APPARATUS FOR REMOVING CARBON PARTICLES FROM EXHAUST GAS FROM INTERNAL COMBUSTION ENGINE

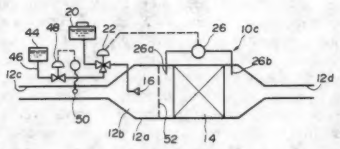
Mitsuo Kurihara, Machida; Fumio Sato, Kawasaki; Yoshiyuki Iwasawa, Tokyo; Nobutaka Koibuchi, Koganei, and Hiroshi Harada, Matsudo, all of Japan, assignors to Tokyo Roki Co., Ltd. and Shimizu Construction Co., Ltd., both of, Japan

Filed Nov. 27, 1984, Ser. No. 675,132

Claims priority, application Japan, Nov. 30, 1983, 58-225559

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—283 **1 Claim**



1. Apparatus for removing particulate emissions from exhaust gas from an internal combustion engine which apparatus comprises:

(a) filter mounted on an exhaust pipe of the engine, said filter comprising a body defining a filter chamber and a filter element mounted within said filter chamber for collecting carbon particles constituting the particulate emissions;

(b) means for dispersing a solution of catalyst to the exhaust gas in said filter chamber at a position upstream of said filter element to cause the oxidation of the carbon particles collected in said filter element to remove them therefrom, said dispersing means including a source of supply of said catalyst solution, means connected to said supply source for controlling the flow of said catalyst solution, means for detecting the amount of the carbon particles collected in said filter element to feed a first detection signal when said amount of the carbon particles reaches a predetermined level, means for detecting the temperature of the exhaust gas in said filter chamber to feed a second detection signal until said temperature of the exhaust gas reaches a predetermined level;

(c) means for supplying an auxiliary fuel to the exhaust gas in said filter chamber at a position upstream of said filter element, said auxiliary fuel supply means being operable in response to said second detection signal for supplying said auxiliary fuel to said flow control means, and said flow control means being operable in response to said first detection signal for feeding a mixture of the catalyst solution and the auxiliary fuel to said filter chamber; and

(d) ignition means mounted within said filter chamber adjacent to and upstream of said filter element for igniting said auxiliary fuel fed to said filter chamber to increase the temperature of the exhaust gas.

4,631,077

FOAM PLASTIC AIR FILTER

Barry Spicer, Northants, and Joseph T. Wills, Northampton, both of England, assignors to PipercrossLimited, Lutterworth, England

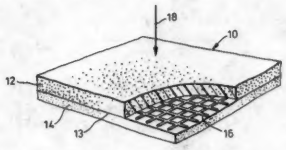
Filed Mar. 26, 1985, Ser. No. 716,087

Int. Cl.[4] B01D *25/04*

U.S. Cl. 55—487 **1 Claim**

1. An air filter comprising a first layer of reticulated foam plastic material having a thickness of between 10 mm and 20 mm and a porosity of 45±4 pores to the linear inch, a second layer of reticulated foam plastic material having a thickness of between 6 mm and 10 mm and a porosity of 65±2 pores to the linear inch, and at the interface between said first and second layers on open mesh substrate approximately one millimeter in

thickness constricting a maximum of about ten percent of each of the first and second layers, the filter being impregnated with



a flame proof retention and plasticiser additive, the first and second layers being bonded together at the interface.

4,631,078
COATING OPTICAL FIBRES

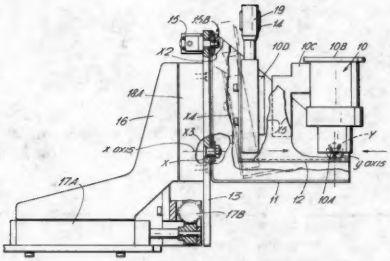
Paul G. Tomlinson, Sawbridgeworth, and Richard T. Newbould, Harlow, both of United Kingdom, assignors to STC plc, London, England

Filed Oct. 2, 1985, Ser. No. 782,930

Claims priority, application United Kingdom, Oct. 10, 1984, 8425610

Int. Cl.⁴ C03B *37/027*; C03C *25/02*

U.S. Cl. 65—3.11 **5 Claims**



1. A method of coating an optical fibre comprising drawing the fibre through a coating applicator having an entrance orifice and an exit orifice substantially concentric about the fibre, monitoring the concentricity of the coating on the fibre, and tilting the applicator about a pivot point at or close to the lower exit orifice to adjust and thereby maintain the desired concentricity of the coating on the fibre.

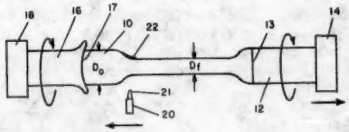
4,631,079
METHOD FOR STRETCHING A GLASS ROD

Harold R. Clark, Plainfield Township, Union County, and David A. Nicol, Hamilton Township, Mercer County, both of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Division of Ser. No. 654,600, Sep. 26, 1984, Pat. No. 4,578,101. This application Nov. 25, 1985, Ser. No. 801,431

Int. Cl.⁴ C03B *23/04*

U.S. Cl. 65—109 **5 Claims**



1. A method for stretching a glass rod which affords increased control over fluctuations in the diameter thereof comprising the steps of:

(a) heating a portion of the rod to a first temperature which is high enough for reflow thereof;

(b) necking down the portion of the rod to approximately the desired final diameter by stretching the rod;

(c) cooling the rod;

(d) progressively reheating the necked down portion of the rod at a lower temperature which is high enough to reflow that portion thereof which had been necked down, but not high enough to reflow the portion of the rod not yet necked down; and

(e) stretching the rod during said progressive reheating to draw out the portion of the rod previously necked down, to the desired final diameter and to provide a new necked down portion from the part of the rod not yet reduced in diameter.

4,631,080
METHOD AND APPARATUS FOR THE HEAT PROCESSING OF GLASS AND GLASS FORMING MATERIAL

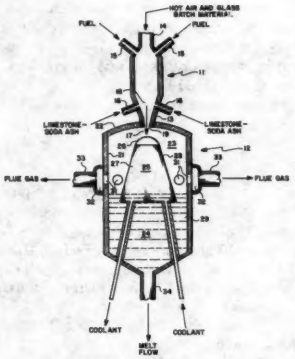
Leonard F. Westra, Reading; Jaime A. Woodroffe, Andover, and David B. Stickler, Carlisle, all of Mass., assignors to Gas Research Institute, Chicago, Ill.

Filed Oct. 4, 1985, Ser. No. 784,188

The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.

Int. Cl.⁴ C03B *3/00*

U.S. Cl. 65—134 **28 Claims**



1. Apparatus for producing a glass product by heat processing glass batch material comprising:

(a) a heating chamber;

(b) means for generating a first hot gas stream having a peak temperature substantially greater than the melting temperature of the glass product;

(c) means for entraining glass batch material in said first hot gas stream;

(d) a separation chamber having an upper separation portion and a lower molten glass collection portion;

(e) nozzle means having an outlet for receiving and exhausting from said heating chamber said first hot gas stream and entrained glass batch material as a directed exhaust stream into said reaction chamber upper portion, said exhaust stream having at said outlet in a plane normal to its direction of flow a first dimension normal to and not greater than a second dimension;

(f) impact surface means within said reaction chamber for receiving said exhaust stream and entrained glass batch material from said nozzle means whereby said entrained glass batch material impacts on said inpact surface means,

said impact surface means being spaced a distance from the outlet of said nozzle means to provide at least substantial separation of entrained glass batch material from: said exhaust stream but not substantially greater than about three times said first dimension;

(g) means for controlling the temperature of said products of combustion, batch material composition and particle size distribution, and the period said glass batch material is entrained in said products of combustion and said exhaust stream to cause at least a portion of said glass batch material to substantially reach a fluid condition prior to the time it impacts on said impact surface means; and

(h) means for receiving glass batch material from said impact surface means and directing said received glass batch material to said separation chamber lower portion.

18. In the method of producing a glass product by heat processing glass batch material, the steps comprising:

(a) generating in a heating chamber a first hot gas stream having a peak temperature substantially greater than the melting temperature of the glass product;

(b) entraining glass batch material in said first hot gas stream;

(c) exhausting said first hot gas stream and entrained glass batch material from said heating chamber into a separation chamber through a nozzle as a directed exhaust stream, said exhaust gas stream at the outlet of said nozzle having in a plane normal to its direction of flow a first dimension normal to and not greater than a second dimension;

(d) causing said exhaust gas stream and entrained glass batch material exiting from said nozzle to impact on an impact surface spaced a distance from the outlet of said nozzle to provide at least substantial separation of entrained glass batch material from said exhaust stream but not greater than about three times said first dimension, at least a substantial portion of said entrained glass batch material being caused to impact and be deposited on said impact surface in at least partial liquid form; and

(e) causing said impacted glass batch material to flow from said impact surface to a collection region.

4,631,081
HERBICIDAL CYCLOHEXANE-1,3-DIONE DERIVATIVES

Keith G. Watson, Box Hill North; Graham J. Bird, North Melbourne; Graeme J. Farquharson, Reservoir; Richard J. Conway, and Peter G. Tucker, both of Essendon, all of Australia, assignors to ICI Australia Limited, Victoria, Australia

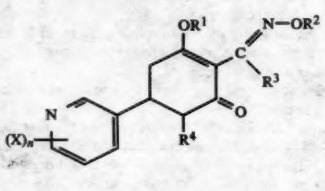
Filed Sep. 27, 1983, Ser. No. 536,392

Claims priority, application Australia, Sep. 29, 1982, PF6111; May 20, 1983, PF9456

Int. Cl.[4] A01N *43/40*

U.S. Cl. 71—94 **6 Claims**

1. A compound of formula III



wherein:

X are independently selected from the group consisting of C_1 to C_6 alkyl, C_1 to C_6 alkoxy C_1 to C_6 alkylthio, halogen and C_1 to C_6 haloalkyl;

R^1 is selected from the group consisting of hydrogen, C_2 to C_6 alkanoyl, benzoyl, the alkali metals, the transition metals, the ammonium ion and the tri- and tetra-(alkyl)ammonium ions wherein alkyl is selected from C_1 to C_6 alkyl and C_1 to C_6 hydroxyalkyl;

R^2 is selected from the group consisting of: C_1 to C_3 alkyl, C_1 to C_3 haloalkyl, allyl, haloallyl, and propargyl;

R^3 is selected from C_1 to C_3 alkyl;

R^3 is selected from hydrogen and (C_1 to C_6 alkoxy)carbonyl;

k is zero; and

n is selected from the integers 3 and 4.

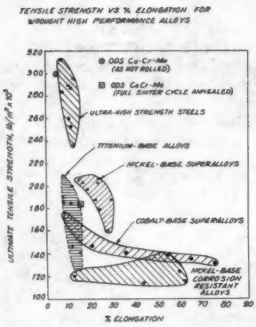
4,631,082
COBALT-CHROMIUM SUPERALLOY

Henry L. Andrews, Old Saybrook, and Gregory E. Gardiner, Branford, both of Conn., assignors to Pfizer Hospital Products Group Inc., New York, N.Y.

Filed Feb. 20, 1985, Ser. No. 703,352

Int. Cl.[4] C22C *29/12*

U.S. Cl. 75—235 **5 Claims**



1. A high strength, corrosion-resistant, high temperature stable, consolidated, biocompatible, composite alloy produced by mechanical alloying and consisting essentially of the following percentage composition by weight:

chromium	26 to 30
molybdenum	5 to 7
manganese	0 to 1
silicon	0 to 1
iron	0 to 1.5
nickel	0 to 2.5
carbon	0 to 0.35
refractory oxide	0.05 to 1.0
aluminum	0.05 to 0.6
titanium	0.05 to 0.6

and the balance cobalt, apart from trace amounts of incidental impurities; in which the refractory oxide is silica or an oxide of a metal of Group IIA, IIIA, IIIB or IVB of the Periodic Table which forms high temperature-stable, non-accretive, fine particles and is present in the dispersed phase and said alloy after fabrication by mechanical alloying, consolidation and hot rolling, has an ultimate tensile strength of at least 250 k.s.i., a 0.2% offset yield strength of at least 220 k.s.i., an elongation of 2 to 5%, and a fatigue strength at 10^7 cycles (Rotating Cantilever Beam) of at least 100 k.s.i.

4,631,083
PIPE VARNISH COMPOSITIONS AND USE THEREOF

Harold H. Christhilf, Trainer, Pa.; Paul E. Morrison, New York, N.Y., and Paul W. Niemczura, W. Chester, Pa., assignors to Witco Corporation, New York, N.Y.

Filed Jun. 17, 1985, Ser. No. 745,762

Int. Cl.[4] C09D *5/08*

U.S. Cl. 106—14.23 **22 Claims**

1. A pipe varnish composition including, as essential ingredients, (a) a thixotropic overbased calcium organic sulfonate/cal-

cium carbonate complex, (b) a drying oil, (c) at least one member selected from the group of epoxidized oils and convertible resins, (d) a drier, and (e) a volatile organic solvent carrier in which said ingredients are dissolved or colloidally dispersed, said pipe varnish composition, after application in the form of a thin film or coating on steel pipe surface and curing, forming a hard essentially non-oily film which protects said steel pipes against corrosion during storage for substantial periods of time.

4,631,084

HEAT-SENSITIVE COMPOSITION AND IMAGING SHEET INCORPORATING SAME

Burt K. Sagawa, Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 458,323, Jan. 17, 1983, Pat. No. 4,531,141. This application May 8, 1985, Ser. No. 731,932

Int. Cl.⁴ C09D *11/00*

U.S. Cl. 106—21 **6 Claims**

1. Heat-sensitive composition comprising:

A. at least two reactants which at normal room temperature do not react with each other, but which, upon application of thermal energy, undergo a chemical reaction with each other which results in change of color, said at least two reactants comprising either (1) a ferric salt of an organic acid and (2) a phenolic compound which forms a complex with the ferric ion of said ferric salt upon application of thermal energy or (1*a*) at least one zinc salt selected from the class consisting of zinc lower alkyl di-substituted di-thiocarbamates, the substituted radicals of which have from one to five carbon atoms, and zinc aryl di-substituted di-thiocarbamates, and (2*a*) at least one heavy metal salt of a higher fatty acid which is non-reactive with said zinc salt at normal room and storage temperature and is reactive therewith at temperatures above the melting point of said zinc salt to produce a color change, and

B. a non-complexing phenolic compound wherein said non-complexing phenolic compound does not have hydroxyl groups in adjacent positions on any aromatic ring of a monocyclic or polycyclic aromatic compound.

4,631,085

AQUEOUS INK COMPOSITION FOR INK-JET RECORDING

Toshiyuki Kawanishi, Numazu; Masaru Shimada; Kakuji Murakami, both of Shizuoka; Tamotsu Aruga, and Hiroyuki Uemura, both of Numazu, all of Japan, assignors to Ricoh Company, LTD., Tokyo, Japan

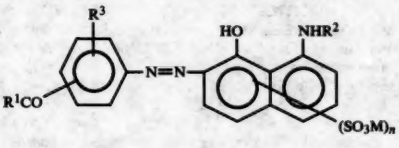
Filed Oct. 22, 1985, Ser. No. 790,197

Claims priority, application Japan, Oct. 23, 1984, 59-221275

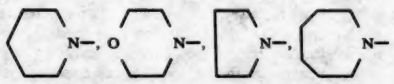
Int. Cl.⁴ C09D *11/02*

U.S. Cl. 106—22 **9 Claims**

1. An aqueous ink composition for ink-jet recording comprising an aqueous solution of a water-soluble dye of formula (I) and a humectant dissolved in water:



wherein R^1 represents



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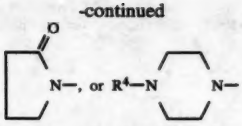


wherein R^4 represents an alkyl group or a hydroxyalkyl group; R^2 represents hydrogen, an alkyl group, an acetyl group, an unsubstituted or substituted benzoyl group, an unsubstituted or substituted benzenesulfonyl group, or a substituted 1,3,5-triazine ring; R^3 represents hydrogen, an alkyl group, an alkoxy group, halogen or a sulfonic acid group; M represents hydrogen ion, an alkali metal cation, amine cation or an ammonium ion; and n is an integer of 1, 2 or 3.

4,631,086

CONCENTRATED COMPOSITIONS FOR COATING CORRUGATED BOARD

James C. Jones, Maumee, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 2, 1985, Ser. No. 751,770

Int. Cl.⁴ C09K *3/14*; B32B *5/16*

U.S. Cl. 106—36 **17 Claims**

1. A concentrated coating composition for coating corrugated board to reduce warp, enhance print quality and provide non-skid properties to the board, the composition comprising a mixture of:

(a) about 20 to 40 wt. % of finely divided silica having an average particle size of about 0.01 to 1 micron;

(b) about 20 to 40 wt. % of urea; and

(c) about 20 to 60 wt. % of water, the weight ratio of silica/urea being about 0.5/1 to about 2.75/1, the composition being stable against premature gelling due to heat or cold and being stable through at least 4 cycles of freezing and thawing.

4,631,087

SURFACE COATING COMPOSITIONS

John H. W. Turner, Stockport, England, assignor to Alcan International Limited, Canada

Filed Dec. 18, 1984, Ser. No. 683,312

Claims priority, application United Kingdom, Dec. 22, 1983, 8334268

Int. Cl.⁴ C08L *91/00*; C08K *5/04*

U.S. Cl. 106—252 **15 Claims**

1. An additive for a surface-coating composition comprising:

(i) at least one aluminium compound which is an aluminium alkoxide or a compound derived from an aluminum alkoxide by an addition, substitution or condensation reaction;

(ii) a stabilizer selected from the group comprising ammonium hydroxide, at least one organic base and a mixture of an organic base with ammonia; and

(iii) a metal-containing organic compound, the metal being selected from Cu, Mn, Fe, Co, Zn and the rare earth metals.

4,631,088

ROAD ASPHALT COMPOSITIONS CONTAINING VISBREAKING RESIDUES

Marc-André Poirier, Ottawa, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ottawa, Canada

Filed Dec. 11, 1985, Ser. No. 807,792

Int. Cl.⁴ C08L *95/00*

U.S. Cl. 106—273 R **7 Claims**

1. A road asphalt composition having a penetration at 25° C. in the range of 85 to 100 comprising a blend of:

(a) a pitch having an initial boiling point of at least 520° C. obtained as a residue in the visbreaking of crude oil, and

(b) a distillation residue having a penetration at 25° C. in the range of 150 to 500 obtained in the distillation of crude oil.

4,631,089

COLOR-INTENSIVE IRON OXIDE BLACK PIGMENTS AND PROCESS FOR THEIR PRODUCTION

Jakob Rademachers; Rolf Naumann, and Günther Teichmann, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 7, 1984, Ser. No. 668,970

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1983, 3341885

Int. Cl.[4] C09C *1/22*

U.S. Cl. 106—304 7 Claims

1. Color intensive black anisometric magnetite iron oxide pigment having an FeO content of from 26 to 29% by weight and manganese content of less than 0.1% by weight, said pigment further having a specific BET surface area of from 5 to 15 square meters per gram and being needle shaped particles with an average needle diameter of 0.1 to 0.2 μm and an average needle length of from 0.6 to 0.8 μm.

4,631,090

PREPARATION AND USE OF IRON MAGNETIC PIGMENTS

Rolf Naumann; Lutz Leitner; Jakob Rademachers, and Gunter Buxbaum, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 31, 1985, Ser. No. 740,090

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 3422916

Int. Cl.[4] C04B *14/00, 35/26;* C01G *49/08*

U.S. Cl. 106—304 14 Claims

1. A magnetic pigment consisting essentially of iron, having a X-ray crystallite size with the 110 reflex of from 14 to 22 nm, a coercive force from 55 to 88 kA/m and a switching field distribution of aligned pigment particles of less than 0.55.

4,631,091

METHOD FOR IMPROVING THE DISPERSIBILITY OF ORGANOCLAYS

Howard Goodman, Cornwall, United Kingdom, assignor to English China Clays Lovering Pochin & Co. Ltd., St. Austell, England

Filed Aug. 13, 1985, Ser. No. 765,259

Int. Cl.[4] C04B *14/00, 33/00*

U.S. Cl. 106—308 N 10 Claims

1. A process for preparing an organoclay which is readily dispersible in an organic liquid medium, comprising the steps of:

(a) suspending a smectite clay in water to form an aqueous suspension;

(b) treating said aqueous suspension of the smectite clay with a solution of an inorganic salt wherein the cation of said inorganic salt has a valency of at least 2, the concentration of the salt being such as to flocculate the smectite clay substantially completely;

(c) mixing the suspension of the flocculated smectite clay with a quaternary ammonium compound at least one of the four alkyl groups of which has from 10 to 24 carbon atoms; and

(c) dewatering the product of step (c).

4,631,092

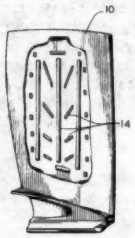
METHOD FOR HEAT TREATING CAST TITANIUM ARTICLES TO IMPROVE THEIR MECHANICAL PROPERTIES

Duane L. Ruckle, and Ponciano P. Millan, Jr., both of Mesa, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 18, 1984, Ser. No. 662,212

Int. Cl.[4] C22F *1/18*

U.S. Cl. 148—3 22 Claims



1. A method of heat treating a cast titanium alloy article comprising the steps of:

heating the article to a temperature above its beta transus temperature;

rapidly cooling the article to produce an acicular martensitic microstructure;

thermally decomposing the martensitic microstructure by stabilizing the article at a temperature between 1500°–825° F.; and

aging the article at a temperature of 1000°–1300° F. for a time of 1 to 8 hours.

4,631,093

CHROMATE FREE METHOD OF TREATING METAL SUBSTRATES TO IMPART CORROSION RESISTANCE AND COLOR TO THE SUBSTRATE SURFACE

Alex Etemovich, Fountain Valley, Calif., assignor to TRE Corporation, Beverly Hills, Calif.

Filed Jul. 27, 1984, Ser. No. 635,056

Int. Cl.[4] C23C *22/48*

U.S. Cl. 148—6.1 19 Claims

1. An aqueous solution for imparting corrosion resistance and color to a metal surface comprising a chrysoidine dye and nitric acid, the pH of the solution ranging from 1.5 to 3.5.

4,631,094

METHOD OF PROCESSING A NICKEL/TITANIUM-BASED SHAPE MEMORY ALLOY AND ARTICLE PRODUCED THEREFROM

John A. Simpson, Mountain View; Keith Melton, Cupertino, and Tom Duerig, Fremont, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Nov. 6, 1984, Ser. No. 668,771

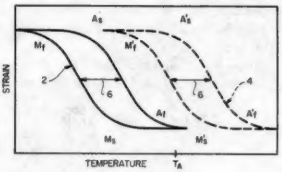
Int. Cl.[4] C22F *1/10, 1/00*

U.S. Cl. 148—11.5 F 56 Claims

1. A method of processing a nickel/titanium-based shape memory alloy having a transformation hysteresis defined by M_s, M_f, A_s, and A_f temperatures, the method consisting essentially of:

overdeforming the alloy, isothermally, at a temperature that is less than about the maximum temperature at which martensite can be stress-induced, by applying a continuously increasing stress sufficient to cause nonrecoverable strain in the alloy so as to temporarily expand the transfor-

mation hysteresis by elevating the A_s and A_f temperatures to A_s' and A_f', respectively, so that the temperature difference between A_s' and M_s is greater than the temperature difference between A_s and M_s; and



storing the alloy at a temperature between A_s and A_s'.

4,631,095

STEEL THAT IS EXPOSED TO HYDROGEN SULFIDE

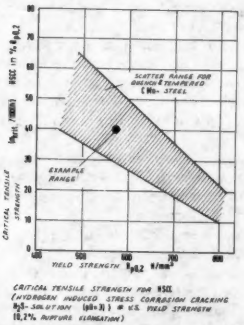
Ingo von Hagen, Krefeld; Hans-Georg Hillenbrand, Düsseldorf, and Rolf K. Popperling, Mülheim, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 24, 1985, Ser. No. 726,799

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1984, 3415590

Int. Cl.[4] C21D *7/08*

U.S. Cl. 148—12 F **3 Claims**


SCATTER RANGE FOR QUENCH-TEMPERED 1 Mo-STEEL
EXAMPLE RANGE
CRITICAL TENSILE STRENGTH
YIELD STRENGTH $\sigma_{p0.2}$ N/mm²
CRITICAL TENSILE STRENGTH FOR NSO. (HYDROGEN INDUCED STRESS CORROSION CRACKING IN 5% SOLUTION (pH=3) * = U.S. YIELD STRENGTH (0.2% RUPTURE ELONGATION)

1. Method of making steel pipes and tubing to be highly resistant against stress corrosion cracking when exposed to H2S, comprising the steps of:

using a ferritic perlite steel within the following alloying range, all percentages by weight:

from 0.3 to 0.45 C

from 1.4 to 1.8 Mn

from 0.2 to 0.5 Si

from 0.2 to 0.5 Cr

from 0.04 to 0.1 V

up to 0.06 Nb

not more than 0.003 S

the remainder being iron

whereby the combined Niobium and Vanadium content must obey the rule that the sum of the V content plus twice the Nb content must not be not less than 0.1%;

making tubing from said steel by hot working; and

cooling in air the hot worked tube from a final temperature attained during hot working so that a texture and grain size in accordance with ASTM finer than 8 obtains and the tubing has strength value of 552 N/square mm≦0.2% of rupture elongation ≦655 N/square mm and a tensile strength exceeding 655 N/square mm.

4,631,096

HIGH ENERGY MATERIALS CONTAINING METASTABLE HELIUM, A PROCESS FOR PRODUCING SAME AND APPLICATIONS THEREOF

Georg Sänger, Voorschoten; Gerrit Hietkamp, Noordwijkerhout, both of Netherlands, and Walter Peschka, Sindelfingen, Fed. Rep. of Germany, assignors to Deutsche Forschungs-und Versuchsanstalt fur Luft-und Raumfahrt E.V., Bonn, Fed. Rep. of Germany

Filed Oct. 1, 1984, Ser. No. 656,311

Int. Cl.[4] C06B *47/00*; C01B *23/00*

U.S. Cl. 149—1 **7 Claims**

1. A high energy chemical complex comprising He_mNH_3.

4,631,097

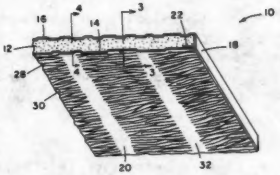
EMBOSSED GYPSUM BOARD

Donald A. Kossuth, Buffalo, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Mar. 11, 1982, Ser. No. 356,977

Int. Cl.[4] B32B *31/12*

U.S. Cl. 156—44 **1 Claim**



1. The method of making predecorated gypsum wallboard comprising the steps of forming a decorative embossed pattern in a web of substantially uniform thickness wallboard face paper, forming a utilitarian embossed pattern, as opposed to a decorative design, in a web of substantially uniform thickness wallboard back paper, said utilitarian embossed back paper being of substantially lower quality paper than the quality of said face paper, and forming a gypsum wallboard with said embossed face paper and said embossed back paper forming respectively the front face and the back side of said wallboard, with a core of gypsum therebetween, said forming step further including the step wherein said back paper is disposed on top of a slurry of settable gypsum during forming of said wallboard, and an elongate lightweight straight bar is disposed on said back paper, extending thereacross, as formed board is continuously moved outward from forming means.

4,631,098

HEAT-RECOVERABLE ARTICLE

Kenneth B. Pithouse, Lesulis, France; Thomas A. Kridl, Union City, and James T. Triplett, Livermore, both of Calif., assignors to Raychem Limited, London, England

Filed Dec. 30, 1983, Ser. No. 567,122

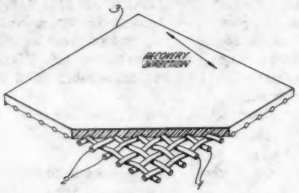
Claims priority, application United Kingdom, Jan. 6, 1983, 8300217; Jul. 23, 1983, 8319855; Aug. 16, 1983, 8322004

Int. Cl.[4] B32B *3/02*

U.S. Cl. 156—86 **24 Claims**

1. A dimensionally heat-recoverable article for enclosing at least part of a substrate, which comprises a fabric having fibres which will recover when heated and which have a tensile strength of at least 0.1 MPa at their recovery temperature, the

fabric having an external surface that is coated with a layer of polymeric material of at least 0.03 mm thickness, the polymeric



material being softenable without flowing when heated to accomodate recovery of the article.

4,631,099

METHOD FOR ADHESION OF OXIDE TYPE CERAMICS WITH COPPER OR ALLOY THEREOF

Yoshihiro Ebata, Kawanishi; Saburo Kose, Ikeda, and Ryozo Hayami, Takarazuka, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jan. 4, 1985, Ser. No. 688,930

Int. Cl.⁴ B32B *31/24*

U.S. Cl. 156—89 **12 Claims**

1. A method for the adhesion of oxide type ceramics and copper or a copper alloy, which comprises placing an oxide type ceramics and copper or a copper alloy in mutual contact, heating them in an oxidative atmosphere thereby effecting adhesion thereof, and subsequently cooling the resultant composite of adhesion at a cooling rate of at least 200° C./sec.

4,631,100

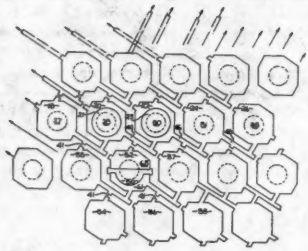
METHOD AND APPARATUS FOR MASS PRODUCING PRINTED CIRCUIT BOARDS

Peter P. Pellegrino, 216 Edgewood La., Apple Valley, Minn. 55124

Continuation-in-part of Ser. No. 439,333, Jan. 10, 1983, Pat. No. 4,521,262. This application Nov. 15, 1984, Ser. No. 671,672

Int. Cl.⁴ C25D *7/00*; C23F *1/02*; B05D *5/00*; B44C *1/22*

U.S. Cl. 156—150 **33 Claims**



1. A method of making printed circuit boards of any of a large number of circuit patterns comprising the steps of

(a) proviiding a printed circuit board blank having an electrically insulative substrate with a predetermined two dimensionally repetitive pattern of conductive pads interconnected by a corresponding two dimensionally repetitive pattern of individual conductive pad interconnects electrically integral therewith on one surface thereof;

(b) coating the conductive pattern with a photoresist;

(c) exposing and developing the photoresist in a predetermined pattern to remove photoresist from those interconnects desired to be opened; and

(d) removing the exposed interconnects whereby the conductive pads and the remaining interconnects provide the desired circuit pattern.

4,631,101

APPARATUS AND METHOD FOR FILAMENT WINDING CYLINDRICAL BODIES WITH CLOSED END

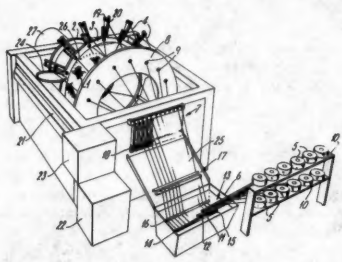
Clifford Rix, Gosport, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 14, 1985, Ser. No. 701,529

Claims priority, application United Kingdom, Feb. 15, 1984, 8403965

Int. Cl.⁴ B65H *81/00*

U.S. Cl. 156—175 **14 Claims**



1. A method of filament winding a hollow body with a closed end characterised in that there are included the following steps:

a. supporting a former at one end;

b. providing circumferentially spaced filament retainers near the opposed end of the former;

c. rotating the former about its longitudinal axis; and

d. laying at least one filament on the former by a filament guide means which traverses the former parallel to the longitudinal axis between the supported end of the former and a position axially spaced beyond the end of the former;

the rotation of the former and the traversing of the filament guide means being selected for controlling the lay angle of the filament on the former up to the filament retainers and also over the end of the former.

6. A filament winding machine for winding cylindrical bodies closed at one end thereof, said machine comprising means to support a former, filament guide means to guide at least one filament in spaced relationship to the former, means to reversibly move the filament guide means relative to the former such that the filament guide means traverses the length of the former and means to rotate the former relative to the filament guide means about an axis parallel to the traversing movement, wherein the improvement lies in that:

the former is secured to a support at one axial end, the remote end being free; a circumferential array of filament retainers is attached to the periphery of the former near said remote end to limit slippage of the filament as it is laid between pairs of adjacent filament retainers; and the means to move the filament guide means traverses to a position beyond said remote end of the former whereby the filament is wound over the end of the former.

4,631,102

METHOD OF MANUFACTURING HEAT EXCHANGE MAT

Yoshiaki Kitagawa, Osaka, and Hideo Iwata, Hirakata, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Mar. 7, 1985, Ser. No. 709,413

Claims priority, application Japan, May 15, 1984, 59-98401

Int. Cl.⁴ C09J *5/02*

U.S. Cl. 156—210 **6 Claims**

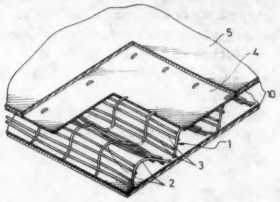
1. A method of manufacturing a heat exchange mat comprising the steps of:

forming a hollow member by providing a textile insert on

both surfaces of a heat exchanging element including wavy warp and linear weft filaments knitted substantially at right angles with each other,

disposing a surface sheet of polyvinyl chloride over each of said textile inserts on both sides of said hollow member, with a pasty polyvinyl chloride resin adhesive interposed between each said surface sheet and its associated insert,

forming a preliminary heat exchange mat member by subjecting said hollow member with said surface sheets to a



first heating step at about 170° C. for about 1 to 2 minutes for semi-gelatinizing said pasty resin adhesive, and thereafter

fully gelatinizing said pasty resin adhesive by subjecting said preliminary heat exchange mat member to a second heating step at about 170° C. for about 3 minutes and under a pressure while maintaining a required height of said hollow member, wherein said second heating step includes a step of securing a peripheral sealing member to peripheral edges of said preliminary heat exchange mat member.

4,631,103

PROCESS FOR PEELING PROTECTIVE FILM OFF A THIN ARTICLE

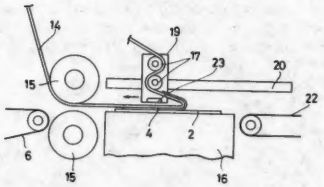
Minoru Ametani, Osaka, Japan, assignor to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 29, 1984, Ser. No. 626,083

Claims priority, application Japan, Apr. 10, 1984, 59-72546; May 25, 1984, 59-107191

Int. Cl.⁴ B44C *1/16;* **B32B** *31/00*

U.S. Cl. 156—241 **4 Claims**



1. Process for peeling a protective adhesive film stuck to substantially the entire surface of one side of a thin article such as a silicon wafer, comprising:

(a) feeding a web of adhesive tape, having an adhesive surface, from a source of supply to a position above the protective film with the adhesive surface facing the protective film;

(b) adhering said tape to substantially the entire surface of said protective film while adhered to the article;

(c) applying a holding force to said article; to hold the article stationary

(d) while holding said article stationary, peeling said protective film off the article by the adhesive force of said adhesive tape acting on the protective film while taking up said adhesive tape; and said protective film and

(e) said taking up of said adhesive tape being started some time after the peeling of the adhesive tape and the protective film from said article has been started.

4,631,104

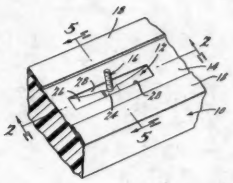
STUD ATTACHMENT METHOD FOR VEHICLE MOLDING

Norman C. Jackson, Livonia, Mich., assignor to The Standard Products Company, Cleveland, Ohio

Filed Sep. 30, 1982, Ser. No. 431,292

Int. Cl.⁴ B32B *31/20*

U.S. Cl. 156—293 **13 Claims**



1. A method of attaching a first member to a second member, said first member having a laterally-protruding base portion thereon, said method comprising:

forming a cavity in said second member, said cavity being adapted for receiving said base portion of said first member therein when said base portion is in a first lateral orientation;

heating at least said base portion of said first member;

inserting said base portion of said first member into said cavity;

moving said heated base portion to a second lateral orientation in order to locally melt a portion of the material of said second member surrounding said cavity and to embed said base portion in said material;

cooling said material of said second member to cause it to reharden around said base portion, thereby forming an interlocking engagement between said first and second members.

6. A method of attaching a mounting member to a thermoplastic member, said mounting member having a laterally-elongated base portion thereon, said method comprising:

forming an elongated slot in said thermoplastic member, said slot having lateral length and width dimensions at least as large as the corresponding length and width dimensions of said elongated base portion;

heating at least the elongated base portion of said mounting member;

inserting said elongated base portion of said mounting member into said slot in a non-interfering relationship with said thermoplastic member;

rotating the heated elongated base portion in a generally lateral plane so that said heated elongated base portion locally melts, traverses through, and embeds itself in, a portion of the thermoplastic member surrounding said slot;

cooling said portion of said thermoplastic member to reharden the thermoplastic material around said elongated base portion and to form an interlocking engagement between said mounting member and said thermoplastic member.

4,631,105

PLASMA ETCHING APPARATUS

John C. Carroll, Hayward, and Robert A. Shepherd, Jr., Oakland, both of Calif., assignors to Branson International Plasma Corporation, Hayward, Calif.

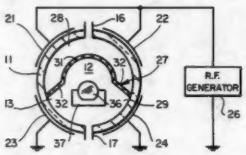
Filed Apr. 22, 1985, Ser. No. 725,802

Int. Cl.⁴ B44C *1/22;* **C03C** *15/00;* **C23F** *1/00;* **H01L** *21/306*

U.S. Cl. 156—345 **18 Claims**

1. Plasma etching apparatus comprising a reaction chamber having a peripheral wall, means for introducing a reagent gas into the reaction chamber, a perforated shield extending between two points on the chamber wall and dividing the cham-

ber into first and second regions on opposite sides of the shield, said first region being bounded by the shield and a first portion of the chamber wall and said second region being bounded by the shield and a second portion of the chamber wall, a driven electrode positioned outside the chamber wall adjacent to the first region, a grounded electrode positioned outside the chamber wall adjacent to the second region, and means for energizing the electrodes to ionize the gas and form a plasma of active species in the first region, said active species passing through the perforated shield and impinging upon a workpiece in the second region, the glow discharge of the plasma being confined to the first region.



4,631,106

PLASMA PROCESSOR

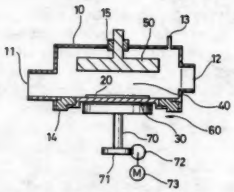
Norio Nakazato, Kudamatsu; Yutaka Kakehi, Hikari; Takeshi Harada, Chiyoda; Ryoji Fukuyama; Makoto Nawata, both of Kudamatsu; Hironobu Ueda, Hitachi; Yutaka Omoto; Katsuaki Nagatomo, both of Kudamatsu, and Fumio Shibata, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,725

Claims priority, application Japan, Sep. 19, 1984, 59-194695; Nov. 21, 1984, 59-244417; Nov. 21, 1984, 59-244418; Mar. 13, 1985, 60-48305; May 15, 1985, 60-101229; May 15, 1985, 60-101230; May 15, 1985, 60-101231

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/00*

U.S. Cl. 156—345 **12 Claims**



1. A plasma processor comprising a processing chamber, means to reduce a pressure in said processing chamber so as to evacuate an interior thereof, means to introduce a processing gas into said processing chamber, means to generate an electric field within said processing chamber, and means to establish a magnetic field orthogonal to the electric field, this means being rotatable relative to a surface to-be-processed of a sample which is processed in a plasma arising under an action of the electric field and the magnetic field.

4,631,107

THERMOPLASTIC FITTING ELECTRIC HEAT WELDING APPARATUS

Russel G. Ramsey, Holdenville, Okla., assignor to Central Plastics Company, Shawnee, Okla.

Division of Ser. No. 734,836, May 16, 1985, Pat. No. 4,602,148. This application Jan. 21, 1986, Ser. No. 820,126

Int. Cl.[4] B32B *31/26*

U.S. Cl. 156—359 **6 Claims**

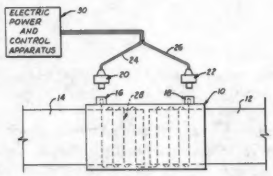
1. Apparatus for electrically heat welding a thermoplastic fitting having an electric resistance heating element disposed therein connected to a pair of electric contacts attached to said fitting whereby a regulated quantity of electric power is supplied to the heating element during the welding process and the making of a high quality weld is insured comprising:

electric power generating means for producing controlled electric power;

current sensor means for sensing the magnitude of the current flow from said electric power generating means electrically connected thereto;

electric cable means connected to said electric power generating means and adapted for removable connection to said electric contacts of said fitting for conducting electric power to said electric resistance heating element of said fitting;

switch means electrically connected between said electric power generating means and said cable means; and



computer means operably connected to said current sensor means and said switch means for receiving and comparing the magnitude of the current flowing through said resistance heating element of said fitting with predetermined current levels for various sizes of fittings and thereby determining the size of the fitting being welded and the total time the constant voltage electric power should be supplied to said heating element of said fitting for the making of a high quality weld, and for comparing such magnitude at predetermined time intervals with predetermined current levels for the size of fitting being welded to thereby determine if the welding process is proceeding abnormally at such time intervals and for operating said switch means to terminate the supply of electric power to said heating element of said fitting if it is determined that said welding process is proceeding abnormally or otherwise at the end of the total time determined to be required for the making of a high quality weld.

4,631,108

APPARATUS FOR FABRICATING HONEYCOMB INSULATING MATERIAL

Wendell B. Colson, Boulder, Colo., assignor to Thermocell, Ltd., Broomfield, Colo.

Continuation-in-part of Ser. No. 406,319, Aug. 9, 1982, Pat. No. 4,450,027. This application May 22, 1984, Ser. No. 612,875

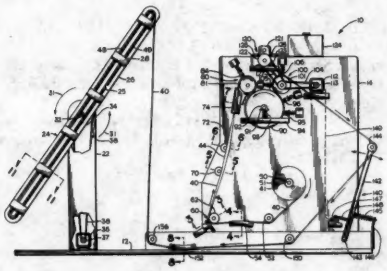
Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—461 **29 Claims**

1. Apparatus for fabricating honeycomb material, comprised of:

stacking means for continuously stacking a plurality of elongated sections of continuous tubular material in layers one over another to form a collapsed panel of honeycomb material, said stacking means including a rotatable rack having an elongated flat surface thereon, the plane of which is parallel to the axis of rotation and is adapted for

receiving thereon and retaining successive layers of said tubular material; and folding means for continuously



forming a strip of flat, thin, flexible material into a tubular structure prior to stacking on said rack.

4,631,109

SINGLE FACER

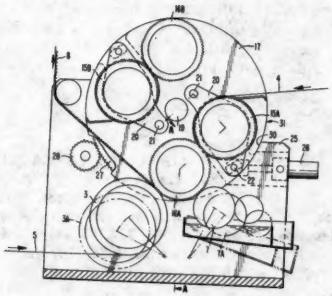
Tadashi Hirakawa; Kiyomitsu Yoshikawa; Shigenari Yoshioka, and Hiroaki Sasashige, all of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 30, 1984, Ser. No. 666,376

Claims priority, application Japan, Nov. 10, 1983, 58-211417

Int. Cl.⁴ B31F *1/28*

U.S. Cl. 156—472 **1 Claim**



1. In a single facer of the type wherein a core paper sheet introduced in a first direction is corrugated by means of a pair of upper and lower corrugated rolls, said rolls having a corrugated circumferential configuration, the corrugated core paper sheet has its crest portions applied with paste, and then a liner introduced to said single facer from a second direction different from said first direction is pasted on the corrugated paper sheet while passing between said lower corrugated roll and a pressure roll to form a single-faced corrugated sheet, the improvement wherein:

said single facer comprises a rotatable frame supporting said pair of upper and lower corrugated rolls; and at least one pair of additional upper and lower corrugated rolls also is supported from said rotatable frame and has a different shape of circumferential corrugations from that of said first mentioned pair of upper and lower corrugated rolls; and means for rotating said rotatable frame for bringing a selected said pair of corrugated rolls into operative position with said pressure roll for performing a corrugating operation.

4,631,110

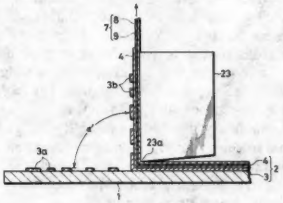
PEELING TYPE DEVELOPING APPARATUS

Akio Tsumura; Shun-ichi Hayashi; Chiharu Miyaake; Kazuo Oouchi, and Yutaka Yamamura, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Japan

Filed Jul. 25, 1985, Ser. No. 758,985

Int. Cl.⁴ B32B *31/16*

U.S. Cl. 156—584 **7 Claims**



1. A peeling type developing device in which an image forming material layer comprising a transparent support and a photopolymerization compound layer formed thereon is formed on the surface of a rectangular substrate on which an image composed of exposed portions of said photopolymerization compound layer is to be formed, comprising: means for sticking an adhesive tape to said transparent support after said image forming material layer has been exposed in such a manner that said adhesive tape crosses opposite corners of said substrate; a pair of conveying pinch rolls for conveying said substrate obliquely; a peeling bar extending in a direction perpendicular to a direction of conveyance of said substrate; a pair of peeling pinch rolls for pulling said adhesive tape away from said substrate at a constant speed while moving said tape over said peeling bar with said peeling bar in line contact with said substrate through said adhesive tape and said picture forming material layer, whereby said adhesive tape, said support, and unexposed parts of said photopolymerization compound layer are peeled from said substrate, and exposed parts of said photopolymerization compound layer remain on said substrate.

4,631,111

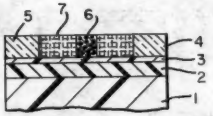
DICHROMIC PROCESS FOR PREPARATION OF CONDUCTIVE CIRCUIT

David W. Williston, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 27, 1984, Ser. No. 675,229

Int. Cl.⁴ B44C *1/22*; B29C *17/08*; G03C *5/00*

U.S. Cl. 156—630 **17 Claims**



1. A process for the preparation of a conductive circuit which comprises

(a) applying to a substrate two photohardenable layers, the upper photohardenable layer being sensitive to ultraviolet radiation and relatively insensitive to visible radiation and being hardenable and nontacky when exposed to short wavelength ultraviolet actinic radiation but unhardenable when exposed to longer wavelength visible radiation, and the lower photohardenable layer being tacky and hardenable when exposed to the longer wavelength visible actinic radiation;

(b) exposing the photohardenable layers to radiation con-

taining ultraviolet and visible radiation through a dichromic phototool containing one or more areas characteristic of a circuit pattern which transmit visible radiation and masks out ultraviolet radiation whereby the lower photohardenable layer becomes hardened but remains tacky and the upper photohardenable layer remains unhardened, one or more clear areas which transmit visible and ultraviolet radiation whereby the upper and lower photohardenable layers become hardened, and areas characteristic of vias of the circuit pattern which mask out all said radiation;

(c) removing with a solvent the unhardened areas of the upper photohardenable layer to uncover the exposed tacky areas of the lower photohardenable layer corresponding to the circuit pattern and removing unhardened areas of the unexposed lower photohardenable layer forming holes corresponding to the vias;

(d) applying finely divided metal, alloy or plating catalyst material to the uncovered tacky circuit areas and edges of the via holes of the lower photohardenable layer; and

(e) plating the metallized or catalyzed image to form an electrically conductive circuit.

4,631,112

SURFACE-TREATED ALUMINUM ALLOY SUBSTRATES FOR MAGNETIC DISKS

Eiki Usui, and Masahiro Kawaguchi, both of Mooka, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Apr. 18, 1985, Ser. No. 724,639

Claims priority, application Japan, May 1, 1984, 59-88199

Int. Cl.⁴ B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—644 **7 Claims**

1. A method for treating surfaces of magnetic disk substrates of aluminum alloy with an anodic oxide film on the surfaces thereof to render said surfaces heat resistant and substantially free from cracking, which comprises dissolving a portion of said anodic oxide film by an etching treatment to broaden the micropores of said anodic oxidation film to a diameter having an enlargement rate in the range of 10–150%, based upon the micropore diameter before said etching treatment but after anodic oxidation, provided that the enlarged pore diameter is at least about 170 Å.

4,631,113

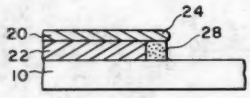
METHOD FOR MANUFACTURING A NARROW LINE OF PHOTOSENSITIVE MATERIAL

Raymond G. Donald, Los Gatos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Dec. 23, 1985, Ser. No. 812,538

Int. Cl.⁴ B44C *1/22*; B29C *17/08*; C03C *15/00*; C23F *1/02*

U.S. Cl. 156—659.1 **12 Claims**



1. A method comprising the steps of:

forming a first film along the upper surface of a substructure;

covering a portion of the first film with a patterned second film;

removing the uncovered portion of the first film and a contiguous part of the covered portion of the first film, whereby a portion of the patterned second film overhangs the remainder of the first film;

forming a layer of photosensitive material on at least the surface portion of the substructure where the material of the first film has been removed;

removing substantially all of the layer of photosensitive material except for the portion under the overhanging portion of the patterned second film; and

removing substantially all the remaining material of the films.

4,631,114

METHOD FOR REMOVING A SURFACE LAYER FROM A METAL FLUORIDE GLASS

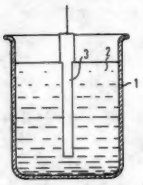
Hartmut Schneider, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 12, 1986, Ser. No. 840,582

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1985, 3514082

Int. Cl.⁴ C03C *15/00*

U.S. Cl. 156—663 **15 Claims**



1. A method for the removal of a surface layer from a metal fluoride glass of the type suitable for the manufacture of fibers for optical communications technology and which glass contains ions of at least one chemical element whose fluoride is difficultly water-soluble, said process comprising the step of contacting surface portions of said glass with an etchant solution for sufficient time to etch the surface portions of said glass, the etchant solution containing dissolved therein at least one material selected from the group consisting of (a) at least one fluoride complexing agent, (b) at least one complexing agent capable of complexing with the ions of said chemical element whose fluoride is difficultly water-soluble, and (c) mixtures thereof.

4,631,115

DEHYDRATION OF ETHANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, and An-I Yeh, 709 S. 12th Ave., both of Bozeman, Mont. 59715

Continuation-in-part of Ser. No. 752,784, Jul. 8, 1985, abandoned. This application Dec. 23, 1985, Ser. No. 812,734

Int. Cl.⁴ B01D *3/40*; C07C *29/84*

U.S. Cl. 203—19 **8 Claims**

1. A method for recovering anhydrous ethanol from a mixture of ethanol and water which comprises distilling a mixture of ethanol and water containing not more than 30% water in a rectification column in the presence of about one part of extractive agent per part of ethanol-water mixture, recovering water as overhead product, obtaining the ethanol and the extractive agent from the stillpot, separating the ethanol from the extractive agent by distillation in another rectification column, wherein the extractive agent comprises at least a benzoate containing from eight to twenty carbon atoms.

4,631,116

METHOD OF MONITORING TRACE CONSTITUENTS IN PLATING BATHS

Frank A. Ludwig, Rancho Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 5, 1985, Ser. No. 741,492

Int. Cl.⁴ G01N *27/42, 27/40*

U.S. Cl. 204—1 T **21 Claims**

1. A method for monitoring the minor constituents present in a solution used in a plating process wherein said minor constit-

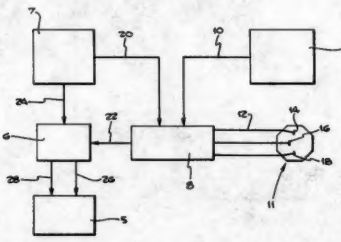
uents affect plating deposit properties, said method comprising the steps of:

(a) applying a selected dc potential to a working electrode which has been subjected to pretreatment and is positioned with said solution containing said minor constituents;

(b) superimposing a constant ac signal on said dc potential applied to said working electrode, said ac signal having a peak to peak potential and a frequency and producing an ac current;

(c) varying said dc potential at a chosen sweep rate over a chosen range; and

(d) measuring said ac current at one or more phase angles with respect to said constant ac signal between said working electrode and a counter electrode positioned within said solution as said dc potential is varied over said range, said measurement of ac current in relation to varying dc potential being expressed as an ac current spectra wherein the improvement comprises varying in combination each parameter comprising said peak to peak potential of said ac signal, said frequency of said ac signal, said sweep rate of said dc potential, said range of dc potential, said one or more phase angles, and said pretreatment of said working electrode, to determine the specific value of each said parameter which, when taken in combination with the remaining said parameters, provides maximum spectra detail in said ac current spectra to determine and monitor said minor constituents in said solution which affect said plating deposit properties.



4,631,117

ELECTROLESS PLATING PROCESS

Karl L. Minten, Cannock, United Kingdom; Angelo J. Battisti, New City, N.Y., and Galina Pismennaya, Palisades Park, N.J., assignors to Olin Hunt Specialty Products Inc., Palisades Park, N.J.

Continuation-in-part of Ser. No. 731,188, May 6, 1985. This application May 5, 1986, Ser. No. 859,672

Int. Cl.[4] C25D *5/02, 5/54*

U.S. Cl. 204—15 **22 Claims**

1. A process for electroless plating a conductive metal layer to the surface of a non-conductive material which comprises:

(a) preparing a liquid dispersion of carbon black comprised of:

(1) carbon black particles having an average particle diameter of less than about 3.0 microns in said dispersion;

(2) an effective dispersing amount of a surfactant which is compatible with said carbon black; and

(3) liquid dispersing medium, wherein the amount of carbon black is sufficient to coat substantially all of said non-conducting surfaces and is less than about 4% by weight of said liquid dispersion;

(b) applying said liquid dispersion to the surface of the non-conducting material;

(c) separating substantially all of said liquid dispersing medium from said carbon black particles, whereby said particles are deposited on said non-conductive surface in a substantially continuous layer; and

(d) electroless plating a substantially continuous conductive metal layer over the deposited carbon black layer and said non-conductive surface.

4,631,118

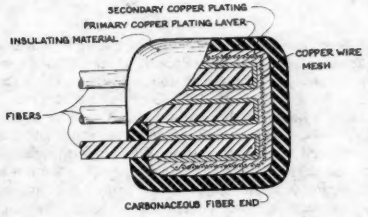
LOW RESISTANCE COLLECTOR FRAME FOR ELECTROCONDUCTIVE ORGANIC, CARBON AND GRAPHITIC MATERIALS

Francis P. McCullough, Lake Jackson, and Roy V. Snelgrove, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 2, 1985, Ser. No. 729,702

Int. Cl.[4] C25D *5/48*

U.S. Cl. 204—16 **24 Claims**



1. A method for producing a low resistance electrical connection onto an electroconductive material selected from the group consisting of electroconductive polymeric organic materials, carbon and graphite which consists of

(1) electroplating the area of desired electrical contact with an electroconductive metal;

(2) joining said so plated area into a continuous electroconductive path by crimping a fine wire mesh or gauze of electroconductive metal onto said electroplated area and at least the abutting electroconductive material; and thereafter bonding and coating said mesh/gauze to said plated area by subjecting said area to a treatment selected from the group consisting of (i) continuing said plating to bond said mesh to said plated area; (ii) applying a solder coat onto and over said mesh embedding said mesh in said solder; or (iii) applying a solder bead onto said electroplated area securing said mesh/gauze to said electroplated area;

(3) connecting an electrical current carrying conductor to said metal area;

(4) coating said metal area and at least a portion of any electrical current carrying conductor attached thereto and the electroconductive material immediately adjacent to said metal area by subjecting said area to a treatment selected from the group consisting of

(a) coating with

(i) a polymeric organic non-conductive material,

(ii) a cathodic electrodepositable polymeric material,

(b) applying an

(i) oxidizable metal thereto and oxidizing the same

(ii) fluoridizable metal thereto and fluoridating the same,

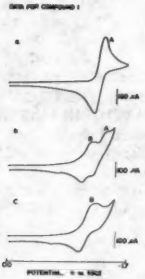
or

(c) oxidizing or fluorinating said metal surface per se.

4,631,119
REVERSIBLE, ELECTROCHEMICALLY-SWITCHED LARIAT ETHERS

George W. Gokel, and Luis Echegoyen, both of Miami, Fla., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 554,686, Nov. 23, 1983, abandoned. This application May 22, 1985, Ser. No. 736,993
Int. Cl.[4] C25C *1/00*
U.S. Cl. 204—59 R 1 Claim

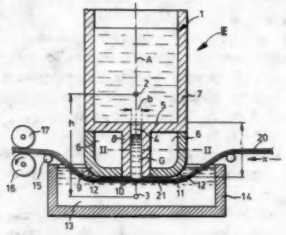


1. The electrochemical process of forming a radical anion of a heteromacrocyclic ring compound composed of a substituted heteromacrocyclic ring containing 12–36 contiguous atoms selected from the group C, N, O or S, said N, O or S being separated by at least two carbon atoms, one or more of said ring C or N atoms having attached thereto a substituted or unsubstituted sidearm consisting of C, N, O of S, said sidearm having attached thereto at the other terminus thereof a substituted carbocyclic aromatic or substituted or unsubstituted heteroaromatic residue containing at least one uncharged Lewis basic donor group, the reduction potential of said residue being less than 2.0 V vs. SCE, said sidearm being of sufficient length and flexibility, such that the donor group on or part of the residue will position itself over the macroring cavity to interact with any ring bound cation which is present, which comprises electron transfer thereto.

4,631,120
METHOD IN WHICH ELEMENTAL PARTICLES ELECTROPHORETICALLY MIGRATE THROUGH A GEL ONTO A COLLECTING SURFACE OF A MOVING BELT

Fritz Pohl, Zähringer Platz 21, D-7750 Konstanz, Australia

Filed Jun. 12, 1981, Ser. No. 273,116
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1980, 3022527
Int. Cl.[4] G01N *27/26*
U.S. Cl. 204—182.8 24 Claims

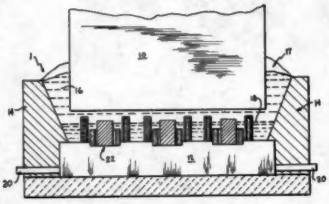


1. A method of performing electrophoresis comprising electrophoretically producing migration of elemental particles through a porous substance to a collection region thereof, transporting a belt having a collecting surface past said collection region of said porous substance and collecting said elemental particles from said collection region onto said collecting surface for transport with said belt away from the porous substance.

4,631,121
ALUMINA REDUCTION CELL

Douglas V. Stewart, Florence; Alton T. Tabereaux, Sheffield, and John T. Willett, Florence, all of Ala., assignors to Reynolds Metals Company, Richmond, Va.

Filed Feb. 6, 1986, Ser. No. 826,727
Int. Cl.[4] C25C *3/08, 7/04, 7/02*
U.S. Cl. 204—243 R 10 Claims

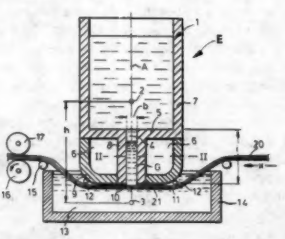


1. In an alumina reduction cell having an anode, a carbonaceous cathode and a plurality of refractory hard metal (RHM) shapes resting upon, but not fixedly mounted to, said cathode, said RHM shapes having a height sufficient to extend vertically upwardly from said cathode, through a molten aluminum pad and into an alumina-cryolite bath, the improvement comprising inert refractory stabilizing sleeves surrounding said RHM shapes and fixedly mounted to said cathode, said stabilizing sleeves having a height less than said RHM shapes such that said stabilizing sleeves extend vertically into said molten aluminum pad but not into said alumina-cryolite bath, and inert refractory anode stops surrounding said stabilizing sleeves, said anode stops resting upon, but not fixedly mounted to, said cathode and having a height greater than said RHM shapes.

4,631,122
ELECTROPHORETIC APPARATUS EMPLOYING A COLLECTING BELT MOVING IN CONTACT WITH A GEL

Fritz Pohl, Zähringer Platz 21, D-7750 Konstanz, Australia

Division of Ser. No. 273,116, Jun. 12, 1981. This application Sep. 24, 1985, Ser. No. 779,689
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1980, 3022527
Int. Cl.[4] G01N *27/28*
U.S. Cl. 204—299 R 23 Claims



1. Apparatus for performing an electrophoretic operation comprising first means for accommodating a porous substance, second means for providing an electrical field traversing said

porous substance, displacable tape collection means adjacent the porous substance, and drive means driving said tape collection means to provide relative movement between the tape collection means and the porous substance whereby to effect said electrophoretic operation on an electrophoretically responsive substance inclusive of substances capable of migrating through the porous substance under the influence of said electrical field.

4,631,123

METHOD OF DEHYDROCYCLIZING ALKANES

Waldeen C. Buss, Kensington, and Thomas R. Hughes, Orinda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 344,572, Feb. 1, 1982, Pat. No. 4,435,283. This application Jun. 28, 1982, Ser. No. 393,160
The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.
Int. Cl.[4] C10G *35/06*
U.S. Cl. 208—138 31 Claims

1. A method of reforming hydrocarbons comprising contacting said hydrocarbons with a catalyst comprising a large-pore zeolite containing:

(a) at least one Group VIII metal; and

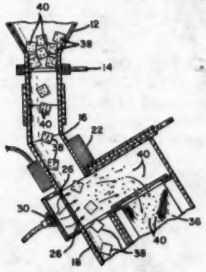
(b) an alkaline earth metal selected from the group consisting of barium, strontium and calcium, wherein the Selectivity Index of the catalyst is greater than 60%.

4,631,124

KINETIC GRAVITY DEDUSTER

Jerome I. Paulson, 969 Edinburgh Dr., Lancaster, Pa. 17604

Continuation-in-part of Ser. No. 495,700, May 18, 1983, abandoned. This application May 20, 1985, Ser. No. 735,790
Int. Cl.[4] B07B *7/04*
U.S. Cl. 209—3 7 Claims



1. A dedusting device for separating dust and similar unwanted debris adhering to particulate material and entrained therewith, said dedusting device comprising:

a series of chambers defining a substantially vertical feed path through which said particulate material falls by gravity, at least one of said chambers being a static electricity neutralization chamber having a linear kinetic cell surrounding a portion thereof; and

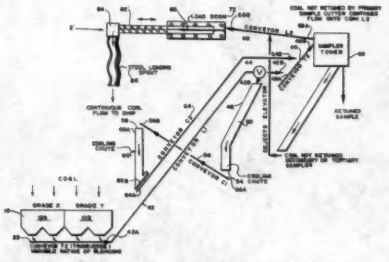
the next adjacent down stream chamber being a cleaning chamber having a perforate lower side and an open upper side and being provided with means to cause a gaseous fluid flow substantially transverse to the particulate material flow whereby the electrically neutralized dust and debris is separated from the remaining particulate material.

4,631,125

MIDSTREAM COAL HANDLING APPARATUS

Billy W. Parks, Mobile, Ala., assignor to Ryan-Walsh Stevedoring Company, Inc., New Orleans, La.

Filed Mar. 26, 1985, Ser. No. 716,346
Int. Cl.[4] B03C *1/00*
U.S. Cl. 209—215 7 Claims



1. An apparatus for the loading of coal upon ocean going vessels comprising:

barge means for supporting the apparatus upon a deck thereof;

receiving means mounted at a first level upon said barge for receiving coal;

continuous movement means mounted on said barge, connected to said receiving means, for establishing a flow of and raising said coal to a second, higher level;

means mounted on said barge for receiving said coal at said second level, adapted to divert said coal to a first or a second alternative flow path,

said first flow path being adapted to cool said coal and to convey said coal to said second flow path,

said second flow path being adapted to move said coal to a sampling position;

sampling means mounted on the barge at said sampling position for extracting a sample of said coal periodically from the flow; and

positionable means for receiving said flow of coal, adapted for delivering said flow of coal to a plurality of positions within an ocean going vessel.

4,631,126

FILTER INSERT SYSTEM

Robert C. Keith, Wellesley, Mass.; Teunis VandenBerg, Walnut, Calif.; Marshall C. Randolph, Wellesley, Mass.; Thomas B. Lewis, Mount Laurel, N.J., and Patrick J. Gillis, Jr., Stoughton, Mass., assignors to Vacco Industries, South El Monte, Calif.

Filed Oct. 25, 1982, Ser. No. 436,642
Int. Cl.[4] B01D *29/38*
U.S. Cl. 210—108 17 Claims

1. In a backflushable filter system, the improvement comprising:

a pressure vessel with an inlet and a waste outlet;

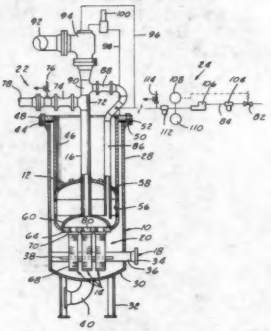
an accumulator chamber comprising a head that closes one side of said pressure vessel;

said accumulator chamber supporting a filter means within said pressure vessel on an inner end of said accumulator chamber;

first passage means defining a passage through said accumulator chamber in fluid communication with the interior of said vessel;

second passage means defining a passage for fluid communi-

cation between the interior of said accumulator chamber and said first passage means;



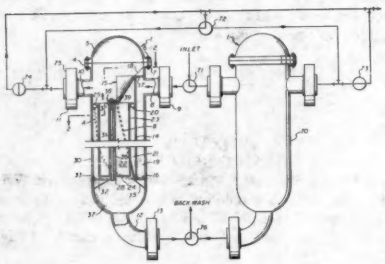
and a valve means for selectively opening or closing said second passage means.

4,631,127

MULTI-PURPOSE FILTER SYSTEM

Paul A. Condit, Sr., 10737 N. Autumnwood Way, The Woodlands, Tex. 77380

Continuation of Ser. No. 549,803, Nov. 9, 1983, abandoned, which is a continuation of Ser. No. 220,976, Dec. 29, 1980, abandoned. This application May 28, 1985, Ser. No. 737,739
Int. Cl.⁴ B01D *29/00*
U.S. Cl. 210—232 **32 Claims**



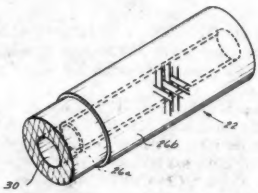
1. A multi-purpose filter system comprising:
a housing having an inlet for receiving fluid to be filtered and an outlet for removal of filtered fluid;
a filter element for filtering the fluid;
means for mounting the filter element in the housing between the inlet and the outlet; and
a tensioning support mounted within said housing;
a tensioning rod affixed to said tensioning support, said tensioning rod extending through said filter element;
adjustable engaging means attached to said tensioning rod for exerting force on said filter element parallel to the cylindrical axis of said filter element thereby placing said element in tension to prevent collapse or flutter of said filter element during operation.

4,631,128

PERMSELECTIVE HOLLOW FIBER BUNDLE

Myron J. Coplan, Natick, and Fred Bilewski, Medway, both of Mass., assignors to Albany International Corporation, Menands, N.Y.

Continuation of Ser. No. 212,193, Dec. 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 943,739, Sep. 19, 1978, abandoned. This application Jun. 6, 1983, Ser. No. 501,368
Int. Cl.⁴ B01D *31/00*
U.S. Cl. 210—321.5 **10 Claims**



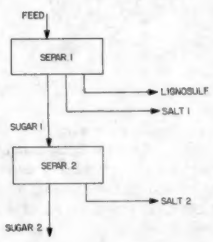
1. In a bundle of permselective hollow fibers to be used in pressure driven separations wherein fiber length is controlled to avoid adverse permeability and selection capabilities the improvement consisting of a plurality of radially displaced annular lamellae of said bundle, each lamella comprising a plurality of wraps of helical segments of fiber in which adjacent helical fiber segments are positioned in helices of opposite hand, each said helical segment of fiber within a respective lamella lying at a radial position R_f substantially constant over a length of said bundle and with all wraps which comprise any given lamella incorporating helical segments each of whose radial position R_f may differ incrementally from one to another segment but with each segment having the same number of turns N per length D; N in each lamella being such that helix paths within each respective lamella are displaced circumferentially and successive traverses of common hand do not overlie one another and thereby substantially avoid helical ridges and each such value of N varies between successive lamellae of increasing median radius.

4,631,129

PRODUCTION OF PURE SUGARS AND LIGNOSULFONATES FROM SULFITE SPENT LIQUOR

Heikki Heikkila, Espoo, Finland, assignor to Suomen Sokeri Oy, Kantvik, Finland

Filed Oct. 4, 1985, Ser. No. 784,819
Int. Cl.⁴ B01D *15/08*
U.S. Cl. 210—635 **9 Claims**



1. A process for the separation of sugars and lignosulfonates from sulfite spent liquor comprising the steps of:
(a) introducing sulfite spent liquor with a pH of 2.5 to 3.5 onto a chromatographic column containing a resin in metal salt form;
(b) eluting the sulfite spent liquor from the column with

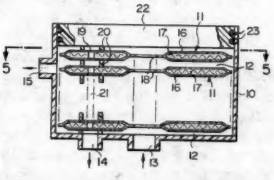
water to recover a substantially sugar-free lignosulphonate-rich fraction and a sugar-rich fraction;
(c) collecting the sugar-rich fraction for further purification;
(d) adjusting the pH of the sugar-rich material to between 5.5 and 6.5 and introducing the material onto a second chromatographic column containing a resin in monovalent salt form; and
(e) eluting the sugar-rich material from the second column with water, whereby a second sugar-rich fraction and a second lignosulfonate-rich fraction are formed.

4,631,130

PLASMA SEPARATOR

Masaharu Watanabe, Kawasaki, Japan, assignor to Terumo Corporation, Tokyo, Japan

Continuation of Ser. No. 520,226, Aug. 4, 1983, abandoned, which is a continuation of Ser. No. 302,551, Sep. 16, 1981, abandoned. This application Oct. 29, 1985, Ser. No. 793,479
Claims priority, application Japan, Sep. 25, 1980, 55-133171; Sep. 26, 1980, 55-134102
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—651 **16 Claims**



1. A plasma separator comprising:
(a) a casing having a blood inlet port, a filtrate outlet port for recovering filtered plasma and a blood outlet port;
(b) a plurality of membrane units piled one above the other acting as filter means arranged within said casing, said membrane unit comprising a filter membrane and a core material superposed one upon the other such that said core material is wrapped in said filter membrane;
(c) a plurality of substantially flat blood channels which are formed between said membrane units and through which blood introduced said blood inlet port is continuously allowed to flow for plasma separation, said plurality of substantially flat blood channels each having a predetermined effective membrane area defined by a chanel width and a channel length, and a channel thickness;
(d) a plurality of plate-like spacers, each said spacer having no blood flow path formed therein and each said spacer being interposed between respective adjacent membrane units at a distance from adjacent membrane units and in a parallel relationship thereto, thereby defining said plurality of substantially flat blood channels between at least one spacer and said adjacent membrane units, said plurality of spacers each having two main surfaces and a number of small projections formed at both moain surfaces thereof;
(e) said filter membrane of said membrane unit comprising a microporous filter membrane having a pore size of 0.1 to 0.8μm, a thickness of from 100 to 300 μm and a porosity of from: 70 to 90%;
(f) said channel thickness of said plurality of substantially flat blood channels being within the range of from 50 to 150 μm;
(g) said channel width a (cm) of said plurality of substantially flat blood channels being so set as to satisfy the following relationship:

$$100 \leqq 6Q/ab^2 \leqq 1000\ (sec^{-1})$$

where Q denotes a blood flow rate (cm^3/sec) corresponding to 50 ml/min. to 500 ml/min., and b denotes said channel thickness; and
(h) said channel width, channel thickness and channel length being so predetermined as to set a pressure drop PD of blood between said blood inlet and outlet ports within the range in which the relation $0 < PD \leqq 0.4$ (Kg/cm^2) is held.

4,631,131

METHOD FOR INHIBITING SCALE

Dionisio G. Cuisia, Chicago, and Chih M. Hwa, Palatine, both of Ill., assignors to R. W. Grace & Co., New York, N.Y.

Division of Ser. No. 559,517, Dec. 8, 1983, Pat. No. 4,600,524. This application Sep. 10, 1985, Ser. No. 774,517
Int. Cl.⁴ C02F *5/14*
U.S. Cl. 210—697 **7 Claims**

1. A method for inhibiting formation of scale in an aqueous steam generating boiler system comprising a chemical treatment consisting essentially of adding to the water in the system scale inhibiting amounts of a composition comprising:
(1) a copolymer of maleic acid and allyl sulfonic acid or a water soluble salt thereof, said copolymer having a molecular weight of from about 800 to about 25,000 and an allyl sulfonic acid to maleic acid mole ratio of about 1:3 to 3:1; and
(2) from about 0.25 to about 4 parts by weight, per part by weight of said copolymer or copolymer salt, of hydroxyethylidene-1,1-diphosphonic acid or a water soluble salt thereof; and further adding to the water
(3) from about 500 to about 0.1 parts by weight, per part by weight of said copolymer or copolymer salt, of a water soluble sodium phosphate hardness precipitating agent.

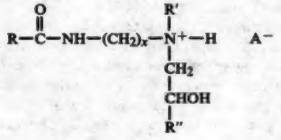
4,631,132

WASTEWATER FLOCCULATING AGENT

Larry D. Jones, Simpsonville, S.C., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jul. 19, 1985, Ser. No. 757,215
Int. Cl.⁴ C02F *1/54*
U.S. Cl. 210—727 **11 Claims**

1. A process for treating wastewater containing an undesired level of suspended organic solids comprising polymeric latex wastes that have been precipitated and coagulated by the addition of an effective amount of lime and phosphoric acid, which comprises (a) adding to the wastewater, subsequent to precipitation and coagulation of said solids, an effective amount of a non-polymeric, cationic flocculating agent comprising a salt of a fatty acid aminoalkyl alkanolamide of the following general structure:



wherein R is a carbon chain of a fatty acid having from 14–22 carbon atoms,
R′ is H, or C_1–C_6 alkyl group,
R″ is H, or CH_3,
x is an integer of 1–6, and A is an anion,
(b) adding to the wastewater an effective amount of an anionic polymeric flocculant, thereby enhancing the flocculation of said precipitated and coagulated solids and thereafter (c) separating the flocculated solids from the water.

4,631,133

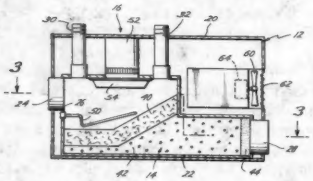
WASTE TREATMENT DEVICE AND METHOD USING MICROWAVES

Burton Axelrod, Girard, Pa., assignor to Axelrod R & D, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 649,939, Sep. 13, 1984, abandoned. This application Jul. 3, 1985, Ser. No. 752,153

Int. Cl.[4] C02F *1/02, 1/30;* B01D *35/18;* F23G *7/04*

U.S. Cl. 210—739 15 Claims



1. A device for separating and disposing of solid waste material from sewage effluent, comprising:

a housing;

an inlet in the housing for introducing sewage effluent into the housing;

filter means disposed in the housing for receiving the sewage effluent introduced into the housing, said filter means having a portion transparent to microwaves and being operable for trapping a generally solid waste material component of the sewage effluent in the microwave transparent portion and passing therethrough a generally aqueous component;

an outlet in the housing for releasing said aqueous component from the housing;

means for incinerating said solid waste material component trapped in the microwave transparent portion of the filter means and operable for reducing said waste material component into an ash particulate, including,

microwave generator means oriented and operable for treating and dehydrating with microwaves the solid waste material trapped by said microwave transparent filter portion, and

heating element means for cooperating with the microwave generator means to incinerate the solid waste material component: and

means for removing the ash particulate from the housing.

9. A method of separating and disposing the solid waste material from sewage effluent, comprising the steps of:

introducing the sewage effluent to a filter media;

separating the sewage effluent into a waste material component suspended in the filter media and a generally aqueous component;

incinerating the waste material component suspended in the filter media into a generally ash particulate, including,

irradiating the waste material component suspended in the filter media with microwaves and heating the waste material component suspended in the filter media, whereby said irradiating and heating cooperate to burn the waste material component suspended in the filter media; and

removing the ash particulate from the filter media.

4,631,134

PROCESS FOR THE INTERMITTENT AERATION OF LIQUIDS AND AERATION DEVICE FOR USE IN SUCH PROCESS

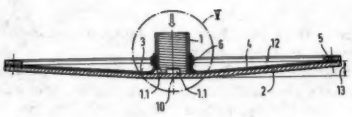
Karl H. Schiissler, Philipp-Reis-Strasse 16, D-6460 Gelnhausen, Fed. Rep. of Germany

Filed May 10, 1985, Ser. No. 732,640

Claims priority, application European Pat. Off., Sep. 12, 1984, 84710032.8; Apr. 10, 1985, 85104359.6

Int. Cl.[4] C02F *3/20*

U.S. Cl. 210—758 17 Claims



1. A process for the intermittent aeration of a liquid such as waste water or the like medium in an aeration tank by means of an aeration device arranged below the surface of the liquid and comprising at least one supporting body having first perforations therein, an air-supply, and an elastic diaphragm covering the supporting body, said diaphragm being of air-tight material and having a second perforations in the form of punctures, slots or holes in parts thereof out of register with said first perforations, as well as a frame structure locking the supporting body in position, said supporting body being rigid, self-supporting and air being directed substantially vertically onto said supporting body in at least deflecting reach thereof, and substantially in the center of gravity thereof or in series along a gravity line, the air being deflected toward the periphery of said body, said periphery being disposed slightly higher vis-a-vis said center of gravity, said air then being passed between said diaphragm and said supporting body with decreasing pressure into the water to be aerated, in an aerating plane being inclined with regard to the water surface at an angle of up to ±90° and is adapted to be swivelled for adjusting that angle.

4. A device for the intermittent aeration of a liquid in an aeration tank, comprising:

a rigid supporting body bearing an aeration face having first perforations therein, of random shape,

a diaphragm of air-tight material covering said supporting body and having a second perforations in parts thereof out of register with said first perforations,

a frame structure adapted for locking said supporting body in a chosen position in the aeration tank,

said supporting body having a center of gravity and a periphery being disposed slightly higher than said center of gravity, an air supply adapted for feeding air directed substantially vertically relative to said supporting body and substantially in the center of gravity thereof, so as to enter a deflecting zone adapted to direct said air toward said periphery and to pass said air between said diaphragm and said supporting body with decreasing pressure into the water to be aerated,

said aerating face extending in a plane being inclined with regard to the water surface at an angle of up to ±90°, and

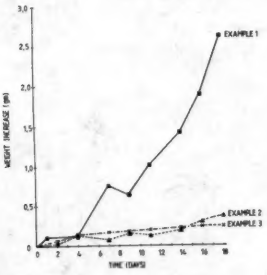
swivelling means associated with said supporting body and adapted for swivelling said body to adjust said angle,

the static resistance of said supporting body being determined, besides the choice of material and the dimensionally of its thickness, by the magnitude of the displacement of the level thereof, situated at an angle of up to ±90° between the deepest point or deepest limit in the center of gravity or on a gravity line, respectively, the inclination of said angle being determined by the cross-sectional area of said aeration face, leading from said deepest point or limit to said periphery.

4,631,135
TREATING A MEDIUM

John E. Duddridge, Faringdon, and Christopher A. Kent, Stoke-on-Trent, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 9, 1985, Ser. No. 721,420
Int. Cl.[4] B01D *37/00*
U.S. Cl. 210—764 8 Claims



1. A method for the reduction or inhibition of biofouling of a part of a system which is subject to contact with a medium capable of causing biofouling by providing biological material which comprises contacting the medium with a support material so as to cause biological material to form on the support material in preference to the said part of the system.

4,631,136
NON-POLLUTING NON-TOXIC DRILLING FLUID COMPOSITIONS AND METHOD OF PREPARATION

Reed W. Jones, III, 1114 W. Hull St., Denison, Tex. 75020

Filed Feb. 15, 1985, Ser. No. 702,077
Int. Cl.[4] C09K *7/06*
U.S. Cl. 252—8.5 M 6 Claims

1. The process for the preparation of a non-polluting non-toxic plant or vegetable oil base drilling fluid composition comprising the steps of:

(a) introducing a plant or vegetable base oil having a C-12 to C-24 carbon chain into a mixing container,

(b) adding a minor amount of antioxidant to said base oil,

(c) adding a minor amount of a synergist for said antioxidant, said synergist being selected from the group consisting of citric acid, ascorbic acid, phosphoric acid, monoesters of ascorbic acid and monoesters of fatty acids, to said base oil,

(d) heating the said base oil including said antioxidants to a temperature of about 93° C. (200° F.),

(e) introducing a minor amount of an oleate ester emulsifier into said base oil with thorough mixing,

(f) adding a minor amount of viscosifier consisting of amine-treated bentonite into said mixture with thorough mixing,

(g) introducing a minor amount of an oleate ester wetting agent into said mixture with thorough mixing,

(h) shear mixing of the mixture for a period of not less than about 30 minutes to effect more thorough mixing to form a stable emulsion, and

optionally (i) adding a finely-divided filler material into said mixture with thorough mixing to form a stable oil base drilling fluid composition having a low coefficient of friction less than about 0.15 for varied drilling purposes.

4,631,137
MATERIALS FOR USE IN DRILLING FLUIDS

Brian Dymond, Bradford, England, assignor to Allied Colloids Ltd., England

Filed Oct. 30, 1984, Ser. No. 666,412
Claims priority, application United Kingdom, Nov. 2, 1983, 8329249
Int. Cl.[4] C09K *7/02*
U.S. Cl. 252—8.514 12 Claims

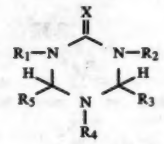
1. A composition comprising a blend of (a) a low molecular weight, water soluble non-ionic or anionic polymer having a molecular weight of about 1,000 to about 20,000 and formed from 0 to 100% acrylamide and 100 to 0% anionic monomer selected from the group consisting of acrylic acid, methacrylic acid, maleic acid, allyl sulfonate and 2-acrylamido-2-methyl propane sulphonic acid and (b) a high molecular weight, water soluble, polymer having molecular weight of at least about 1 million and formed from polymerisable monomers of which 0 to 70% by weight are acrylamide and 30 to 100% by weight are selected from acrylic acid, allyl sulphonate and 2-acrylamido-2-methyl propane sulphonic acid, said blend being substantially free of polymer of molecular weight 50,000 to 500,000, and wherein the weight ratio of low molecular weight polymer:high molecular weight polymer is about 10:1 to 1:5.

4,631,138
CORROSION INHIBITORS

Marshall E. Johns, Creve Coeur; Keith D. Strassner, and Thomas G. Braga, both of St. Louis, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Feb. 7, 1985, Ser. No. 699,390
Int. Cl.[4] C23F *11/04, 11/14, 11/16*
U.S. Cl. 252—8.555 13 Claims

1. Method of inhibiting corrosion of ferrous metals in oil and gas well drilling and production systems comprising adding to said systems an effective corrosion inhibiting amount of a composition comprising a solution, dispersion or emulsion of a compound selected from the group consisting of compounds represented by the formula



wherein X represents oxygen or sulfur, R_1 and R_2 are the same or different and R_3 and R_5 are the same and represent hydrogen, alkyl, cycloalkyl, aryl, aralkyl, alkaryl and heterocyclyl, R_4 represents an organic radical, and the acid salts and quaternary ammonium salts thereof.

4,631,139
CORROSION INHIBITING METAL WORKING FLUID

James R. Burton, Groves, and David J. Kushner, Beaumont, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 8, 1985, Ser. No. 763,504
Int. Cl.[4] C10M *173/00*
U.S. Cl. 252—49.3 18 Claims

1. A water-base composition which is non corroding to metals in contact therewith comprising an effective corrosion inhibiting amount of a concentrate comprising:

A. 2-heptyl-1-ethoxypropionic acid imidazoline, sodium salt in an amount of at least about 2 wt %;

B. a free amine selected from the group consisting of diethanolamine, triethanolamine and mixtures thereof in an amount of about 20 to 27 wt %; and

C. an amine salt of a dicarboxylic acid selected from the group consisting of the diethanolamine and triethanol-

amine salts of a C_8 to C_{14} dicarboxylic acid and mixtures thereof in an amount such that the weight ratio of amine salt to free amine is about 3:8 to 5:8.

4,631,140
FERRIMAGNETIC PARTICLES AND THEIR PREPARATION

Werner Steck, Ludwigshafen, and Helmut Jakusch, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 15, 1985, Ser. No. 787,086
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1984, 3438093
Int. Cl.[4] C01G 49/08
U.S. Cl. 252—62.56 3 Claims

1. Ferrimagnetic particles which are useful as magnetic material for magnetic recording media, which particles comprise a core of a magnetic material exhibiting multiaxial anisotropy and consisting essentially of a ferrimagnetic FeO_x which which is doped uniformly throughout its volume with cobalt(II) ions and in which x is from 1.33 to 1.50, and of a magnetic coating which surrounds the core, possesses uniaxial anisotropy, and consists essentially of Co(II), Fe(II), Fe(III) and oxygen.

4,631,141
ACTIVATION

Paul L. Baxter, Cheshire, England, assignor to Interox Chemicals Limited, London, England

Filed Jan. 16, 1986, Ser. No. 819,276
Claims priority, application United Kingdom, Jan. 30, 1985, 8502374
Int. Cl.[4] C11D 7/20
U.S. Cl. 252—95 25 Claims

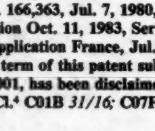
1. A bleach composition comprising a particulate mixture of a hydrogen peroxide-developing persalt and an insoluble mixed oxide of calcium, barium or strontium and manganese.

4,631,142
DIPHOSPHONIC EXTRACTANTS

Georges Sturtz, Brest, France, assignor to Societe Nationale Elf Aquitaine (Production), France

Division of Ser. No. 166,363, Jul. 7, 1980, Pat. No. 4,460,548.
This application Oct. 11, 1983, Ser. No. 540,842
Claims priority, application France, Jul. 9, 1979, 79 17736
The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.
Int. Cl.[4] C01B 31/16; C07F 9/28
U.S. Cl. 252—184 7 Claims

1. A composition for the extraction of a metal from an aqueous solution comprising an organic liquid containing 1 to 30% by weight of a diphosphonic diacid diester of the formula



in which A is a grouping selected from the group consisting of

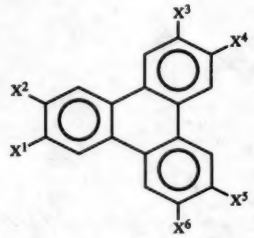
and $—CH_2—CH=CH—$ and R is a C_6 to C_{18} alkyl.

4,631,143
TRIPHENYLENE DERIVATIVES

Klaus Praefcke; Bernd Kohne; Wadi Poules, all of Berlin, and Eike Poetsch, Mühltal, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Dec. 21, 1984, Ser. No. 685,084
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3346980; Jul. 10, 1984, 3425261
Int. Cl.[4] C09K 3/34; C07C 149/30, 149/34, 149/31, 149/415, 147/06, 147/08, 147/14
U.S. Cl. 252—299.62 19 Claims

1. A triphenylene of the formula



wherein X^1 to X^6 are each —SH, —SR, —SOR, $—SO_2R$ or —S—COR, and each R is alkyl of up to 20 C atoms, or such an alkyl group wherein one or two CH_2 groups not bound to S are replaced by O atoms and/or vinylene or vinylidene groups or vinylene or vinylidene groups substituted by F, Cl, or CN, the total number of C atoms being up to 20 in all cases, and O atoms being non-adjacent

the X-substitution being hexakis and saturated, or pentakis and saturated with the sixth X being unsaturated.

16. A discotic liquid-crystalline phase comprising at least two liquid-crystalline components, wherein at least one component is a triphenylene derivative of claim 1.

4,631,144
ALUMINATE PHOSPHOR

William W. Beers, Lyndhurst, and Thomas G. Parham, Gates Mills, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 25, 1985, Ser. No. 715,858
Int. Cl.[4] C09K 11/475
U.S. Cl. 252—301.4 R 10 Claims

1. A fluorescent lamp phosphor comprising a plurality of fine-sized crystals having the general formula:

$$Ce_{1-x-y}La_xTb_yMg_zAl_{11}O_{19}$$

wherein

La is an optional constituent and x is in an amount up to about 0.50,

y is in the range from about 0.20 up to about 0.50, and

z is in the range from about 0.60 up to about 0.87,

said crystals having a median particle size of about 5.0 microns diameter and being further characterized by a ratio between its 544 nanometers wavelength peak emission to its 490 nanometers wavelength peak emission of at least 5.0 along with exhibiting trichromatic coordinate values in the range X=0.3190–0.3202 and Y=0.5377–0.5402 in a low pressure mercury vapor discharge lamp.

4,631,145
DEFOAMER AND ANTIFOAMER COMPOSITION AND METHOD FOR DEFOAMING AQUEOUS FLUID SYSTEMS

Craig Zychal, Houston, Tex., assignor to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 467,335, Feb. 17, 1983, abandoned. This application May 22, 1984, Ser. No. 612,871
Int. Cl.[4] B01D 19/04
U.S. Cl. 252—321 24 Claims

1. A defoamer and antifoamer composition for use in aqueous fluid systems used in the drilling and maintenance of oil and gas wells consisting essentially of (1) a high-boiling mixture comprising ethers, alcohols, esters and aldehydes containing at least 40 wt % components having from 6 to 12 carbon atoms and (2) a fatty acid ester, wherein said high-boiling mixture is present in an amount within the range of about 50 wt % to about 90 wt % and said fatty acid ester is present in an amount within the range of about 10 wt % to about 50 wt %.

14. A method for defoaming an aqueous fluid system used in the drilling and maintenance of oil and gas wells and preventing the formation of foam in said system, which method comprises adding to said system an effective defoaming and antifoaming amount of a composition consisting essentially of (1) a high-boiling mixture comprising ethers, alcohols, esters and aldehydes and (2) a fatty acid ester, said high-boiling mixture being present in an amount within the range of about 50 wt % to about 90 wt % and said fatty acid ester being present in an amount within the range of about 10 wt % to about 50 wt %.

4,631,146
ALPHA-TERTIARY DIMETHYLACETALS AND THEIR USE AS FRAGRANT SUBSTANCES

Helmut Gebauer, and Marlies Regiert, both of Munich, Fed. Rep. of Germany, assignors to Consortium fur elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 639,498, Aug. 10, 1984, abandoned. This application Feb. 19, 1986, Ser. No. 831,156
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341605
Int. Cl.[4] C07C 43/303; C11D 3/50, 9/44; C11B 9/00
U.S. Cl. 252—522 R 7 Claims

1. An α-tertiary dimethylacetal selected from the group consisting of 1,1-dimethoxy-2,5-dimethyl-2-vinyl-4-hexene, 1,1-dimethoxy-2,2,5-trimethyl-4-hexene and 1,1-dimethoxy-2,2-dimethyl-3-phenyl-propane.

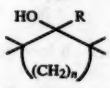
4. A perfumery preparation comprising an effective amount of a compound according to claim 1, as the sole fragrance-imparting substance.

4,631,147
CYCLOALKAN-1-OL DERIVATIVES AND PERFUME COMPOSITIONS COMPRISING THE SAME

Kiyoshi Matsumoto; Yoshiaki Fujikura, both of Utsunomiya, and Motoki Nakajima, Miyashitomachi, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Feb. 6, 1986, Ser. No. 826,905
Claims priority, application Japan, Feb. 18, 1985, 60-30049; Oct. 14, 1985, 60-228439
Int. Cl.[4] C11B 9/00; C07C 35/20; A61K 7/46
U.S. Cl. 252—522 R 2 Claims

1. A cycloalkan-1-ol derivative of the following formula (I)



(I)

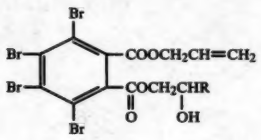
in which R represents a hydrogen atom, lower alkyl group or allyl group, and n is an integer of 3 or 4 provided that when n is 3, R is not a hydrogen atom or lower alkyl group.

4,631,148
FLAME RETARDANT ALLYLIC ESTERS OF TETRABROMOPHTHALIC ACID AND FLAME RETARDANT POLYMERS CONTAINING SAME

Diza P. Braksmayer, Cranbury; Fui-Tseng H. Lee, Princeton, and Fred R. Scholer, East Windsor, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 15, 1985, Ser. No. 712,060
Int. Cl.[4] C09K 21/00; C07C 69/76, 69/80
U.S. Cl. 252—609 6 Claims

3. A flame retardant thermosetting composition comprising a copolymer of an ethylenically unsaturated component capable of further polymerization to the thermoset stage with an allylic flame retardant compound of the formula:



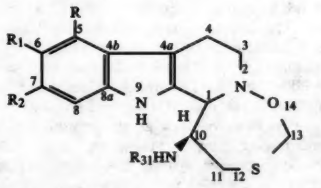
wherein R is an aliphatic group of 1 to 10 carbon atoms.

4,631,149
ANTIVIRAL EUDISTOMINS FROM A MARINE TUNICATE

Kenneth L. Rinehart, Jr., Champaign County, Ill.; Gary C. Harbour, Texas Township, Kalamazoo County, Mich., and Jun'ichi Kobayashi, Tokyo, Japan, assignors to University of Illinois, Urbana, Ill.

Continuation-in-part of Ser. No. 517,117, Jul. 25, 1983, abandoned. This application Feb. 9, 1984, Ser. No. 578,443
Int. Cl.[4] C07D 515/14; A61K 31/39
U.S. Cl. 540—546 1 Claim

1. A compound selected from the group consisting of eudistomins C, E, K, L, F, and the acylates of C and E having the formula II:



II

wherein the variables for each eudistomin are defined as follows:

Eudistomin	R	R_1	R_2	R_{31}
C	H	OH	Br	H
E	Br	OH	H	H
K	H	H	Br	H
L	H	Br	H	H
F	H	OH	Br	—$COCH_2OH$
C (diacetyl)	H	—$OCOCH_3$	Br	—$COCH_3$
E (diacetyl)	Br	—$OCOCH_3$	H	—$COCH_3$

or other carboxylic acylates or pharmaceutically acceptable salts.

4,631,150

PROCESS FOR THE PREPARATION OF PENEMS

Carlo Battistini, Novate Milanese; Maurizio Foglio, Milan; Giovanni Franceschi, Milan, and Cosimo Scarafile, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

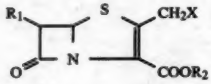
Filed Aug. 6, 1984, Ser. No. 637,878

Claims priority, application United Kingdom, Aug. 11, 1983, 8321677

Int. Cl.[4] C07D 499/00; A61K 31/425

U.S. Cl. 540—310 9 Claims

1. A process for the preparation of a compound of the formula:



(I)

wherein

R_1 represents an organic group selected from the group consisting of a C_1 to C_{12} aliphatic hydrocarbon group, a substituted C_1 to C_{12} aliphatic hydrocarbon group substituted with at least one of hydroxy, amino, cyano, or mercapto; a C_4 to C_7 monocycloalkyl group, a substituted C_4 to C_7 monocycloalkyl group substituted with at least one of hydroxy, amino, cyano, mercapto, or C_1 to C_6 alkyl; phenyl; and substituted phenyl substituted with at least one of hydroxy, amino, cyano, mercapto, or C_1 to C_6 alkyl,

R_2 represents a hydrogen atom or a carboxy-protecting group, and

X represents:

(i) an optionally-protected hydroxy group,

(ii) a halogen atom,

(iii) an azido group,

(iv) a pyridyl group which is unsubstituted or substituted by carbamoyl groups,

(v) a formyloxy group, an unsubstituted acyloxy group having from 2 to 6 carbon atoms, or an acyloxy group having from 2 to 6 carbon atoms, being substituted by one or more halogen atoms, acyl groups having from 2 to 6 carbon atoms, amino, hydroxy, or mercapto groups, the amino, hydroxy or mercapto groups being free or protected,

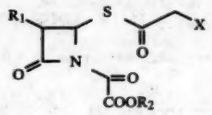
(vi) a carbamoyloxy or N-alkyl-carbamoyloxy group,

(vii) an alkoxy or alkylthio group, each of which has from 1 to 12 carbon atoms and is unsubstituted or substituted by one or more halogen atoms, formyl groups, acyl groups having from 2 to 6 carbon atoms, amino, hydroxy, or mercapto groups, the amino, mercapto, or hydroxy groups being free or protected,

(viii) a triarylmethylthio group, or

(ix) a heterocyclylthio group, wherein the heterocycle is a pentatomic or hexatomic heteromonocyclic ring, containing at least one double bond and at least one heteroatom selected from N, S, and O, unsubstituted or substituted by one or more substituents or a heterobicyclic ring, containing at least two double bonds wherein each of the condensed heteromonocyclic rings, being the same or different, is a pentatomic or hexatomic heteromonocyclic ring containing at least one heteroatom selected from N, S, and O, said heterobicyclic ring being unsubstituted or substituted by one or more substituents,

which comprises the steps of reacting an azetidinone derivative of the formula



(II)

wherein R_1, R_2, and X are as above defined

with up to 2 mole equivalents of a trivalent organophosphorous compound wherein said organophosphorous compound is selected from the group consisting of a cyclic trialkylphosphite, and acyclictrialkylphosphite, a triarylphosphite, a mixed arylphosphite, and phosphoramide

in an inert solvent

at a temperature of from 110° to 150° C. for a period of at least 2 hours or more.

4,631,151

METHOD FOR PRODUCTION OF FLUORINE-CONTAINING AROMATIC DERIVATIVE

Michio Kobayashi; Masato Yoshida, both of Tokyo; Hideo Sawada, Aichi; Hidehiko Hagii, Aichi, and Kazuyoshi Aoshima, Aichi, all of Japan, assignors to Nippon Oil & Fars Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1985, Ser. No. 702,632

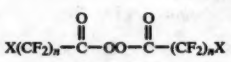
Claims priority, application Japan, Feb. 27, 1984, 59-34400

Int. Cl.[4] C09F 7/00; C07C 19/08

U.S. Cl. 260—408 14 Claims

1. A method for the production of a fluorine-containing derivative of an aromatic compound by introducing an $X(CF_2)_n$—group, wherein X is fluorine, chlorine or hydrogen and n is an integer having a vlaue of 1 to 10, into an aromatic ring of the aromatic compound, which comprises the steps of:

reacting a de(haloacyl)peroxide represented by the general formula:



wherein X and n are as defined above with an aromatic compound selected from the group consisting of (a) benzene, (b) a mono-substituted benzene in which the substituent is a member selected from the group consisting of halogen, alkyl, nitro, ester and alkoxy groups, (c) naphthalene and (d) a monohalo-substituted naphthalene at a temperature 0° to 50° C. at a molar ratio of said di(haloacyl)peroixde to said aromatic compound in the range of 1:2 to 10; and

refining the reaction products to obtain a fluorine-containing derivative of the aromatic compound having the $X(CF_2)_n$—group introduced into the aromatic ring thereof.

4,631,152

HUMIDIFIER

Tetsuei Uchida; Tsutomu Uchida; Nobuo Tsuchida, and Susumu Kazama, all of Sanjo, Japan, assignors to Uchida Manufacturing Co., Niigata, Japan

Filed Oct. 21, 1985, Ser. No. 789,763

Claims priority, application Japan, Mar. 6, 1985, 60-32446[U]

Int. Cl.[4] B01F 3/04

U.S. Cl. 261—4 4 Claims

1. A humidifier comprising:

a closed water tank detachably mounted on the body of the humidifier;

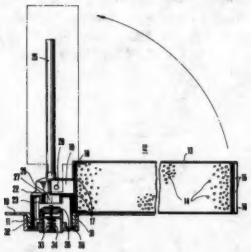
a demineralizer having a container containing ion-exchange resin;

an air exchange pipe for introducing the outside air;

the water tank having a water supply port through which

the demineralizer and the air exchange pipe can be inserted into the water tank;

a housing disposed below the container of the demineralizer and defining a chamber, one hollow end of the container



of the demineralizer being rotatably connected to the chamber such that the container is in communication with the chamber; and

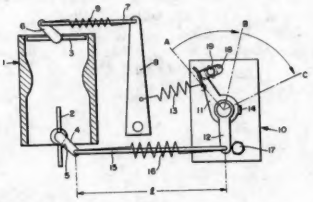
a resilient means for always causing the container of the demineralizer to lie on its side.

4,631,153

THROTTLE CONTROL DEVICE FOR GENERAL PURPOSE ENGINE

Shinichi Tamba, Kakogawa; Toru Ogino, Kobe, and Noboru Fukui, Kakogawa, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 645,173, Aug. 28, 1984, abandoned. This application Dec. 19, 1985, Ser. No. 811,328
Claims priority, application Japan, Sep. 6, 1983, 58-163893
Int. Cl.[4] F02M *3/06*
U.S. Cl. 261—52 **3 Claims**



1. Throttle control device for the general purpose engine comprising;

a throttle lever pivotally supported on a control panel and connected with a throttle valve of a carburetor through a throttle link, a governor arm and a spring;

a choke lever pivotally supported on said control panel and connected with a choke valve of said carburetor through a choke link;

a fastening bolt attached to the control panel on a line extending through the choke link;

said control panel being rotatable around said fastening bolt; and

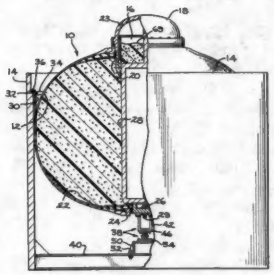
said choke lever being rotatable with said throttle lever in a predetermined timing.

4,631,154

METHOD OF CONSTRUCTING A DOME RESTRAINT ASSEMBLY FOR ROCKET MOTORS

Peter F. O'Driscoll, Los Altos, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 586,952, Mar. 7, 1984, Pat. No. 4,577,542.
This application Dec. 6, 1985, Ser. No. 805,680
Int. Cl.[4] C06B *21/00*
U.S. Cl. 264—3.1 **8 Claims**



1. A method for improving the bond between a cured solid propellant in a rocket motor and a dome portion of the case of said motor, the steps of which comprise:

providing a substantially rigid base fur supporting said case of said motor;

attaching an adjustable restraint assembly between said dome portion and said rigid base;

loosening said restraint assembly prior to loading said case of said motor with uncured propellant to permit maximum downward deflection of said dome portion after said uncured propellant is loaded in said case of said motor but before maximum curing pressure is applied to the propellant in said case of said motor;

loading said case of said motor with uncured propellant;

expanding said restraint assembly between said dome portion and said base to a maximum extent without producing upward deflection or horizontal twisting of said dome portion;

pressurizing said propellant in said case of said motor to a maximum predetermined curing pressure level;

compressing said restraint assembly to produce a net downward deflection of said dome portion essentially equal to the amount of shrinkage of said propellant upwardly away from said dome portion anticipated as a result of the curing of said propellant; and thereafter

expanding said restraint assembly in increments in at least two separate steps at different times during the propellant curing process to permit said dome portion to deflect upwardly toward said propellant to a normal position wherein no downward deflection of said dome portion is produced by said restraint assembly.

4,631,155

PROCESS FOR MANUFACTURE OF SURFACE-MODIFIED ORIENTED POLYMERIC FILM

R. Scott Caines, Taylors, S.C., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Feb. 1, 1985, Ser. No. 697,313
Int. Cl.[4] B29C *17/02*
U.S. Cl. 264—22 **11 Claims**

1. A process for surface modification of oriented, thermoplastic polymeric film comprising subjecting at least one surface of said polymeric film to a short pulse of electromagnetic radiation possessing sufficient intensity to enhance the heat seal adhesion of said film without substantially decreasing the ten-

sile strength of the film, wherein only selected areas or strips of the film surface are subjected to said short pulse of electromagnetic radiation.

4,631,156

SYSTEM AND METHOD OF PARTICULATING 4,4' METHYLENEBIS (2-CHLOROANILINE)

Blair H. Hills, Whitehall, and Vincent J. Crispino, Big Rapids, both of Mich., assignors to Bofors Nobel, Inc., Muskegon, Mich.

Filed Jul. 27, 1984, Ser. No. 634,991
Int. Cl.[4] B02B *5/02;* C22B *1/24;* B01J *2/16*
U.S. Cl. 264—37 45 Claims

1. A method of producing a MBOCA product having granules substantially all of a desired size, said method comprising:

agglomerating MBOCA in an enclosed agglomeration means to produce granular MBOCA and incidentally producing MBOCA dust;

circulating an enclosed gaseous stream through the agglomeration means to carry away the heat of fusion and MBOCA dust;

cooling the gaseous stream;

removing MBOCA dust from the gaseous stream; and

classifying the granulated MBOCA to separate the MBOCA product having granules of a desired size from granules having an undesired size.

4,631,157

PRODUCTION OF PERMEABLE CELLULOSE TRIACETATE MEMBRANES

Bruce M. Johnson, Bend, Oreg., assignor to Bend Research, Inc., Bend, Oreg.

Filed Sep. 16, 1985, Ser. No. 776,522
Int. Cl.[4] B29C *67/20;* B29K *1/00*
U.S. Cl. 264—41 6 Claims

1. A method for the preparation of porous cellulose triacetate membranes comprising:

(a) preparing a casting solution by dissolving from 1.25 wt% to 20 wt% cellulose triacetate in a solvent mixture comprising cyclohexanone and methylene chloride in a weight ratio of from 4:1 to 1:4;

(b) casting a film from said casting solution;

(c) immersing said cast film in a methanol bath at −30° C. to +25° C. to precipitate a membrane; and

(d) recovering said membrane.

4,631,158

SHAPED ARTICLES CF SILICATE MATERIAL, A PROCESS FOR THEIR PRODUCTION AND THEIR USE

Hans-Peter Rieck, Hofheim am Taunus; Martin Schott, Steinbach, and Jürgen Russow, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 31, 1985, Ser. No. 793,562
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1984, 3440252
Int. Cl.[4] B29C *27/60*
U.S. Cl. 264—43 21 Claims

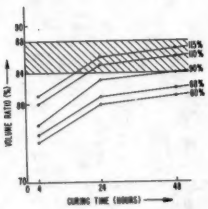
1. A process for the preparation of shaped articles of silicate material, which comprises shaping a pulverulent layered silicic acid of the formula $H_2Si_yO_{2y+1}$, in which y is a number from 1.7 to 24, or a salt thereof, in which all or some of H is replaced by at least one cation from the group comprising Li^+, Na^+, K^+, NH_4^+, Ca^{2+}, Cu^{2+}, Ni^{2+} and Mg^{2+}, into pieces and heating the pieces under conditions such that the starting material is chiefly converted into cristobalite and/or tridymite.

4,631,159

METHOD OF AGING EXPANSION-MOLDED BODY OF POLYOLEFIN

Hirofumi Maeda, Takatsuki; Kazuyoshi Watanabe; Naruhiko Akamatsu, both of Settsu; Kenichi Senda, Hirakata, and Shunichi Nishioka, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 29, 1984, Ser. No. 676,180
Int. Cl.[4] C08J *9/22, 3/24*
U.S. Cl. 264—53 6 Claims



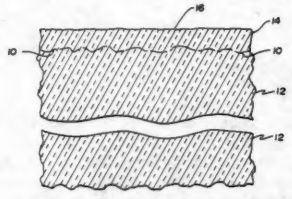
1. A method of aging an expansion-molded body of polyolefin prepared by heating the pre-expanded polyolefin particles filled in a mold which comprises cooling the molded body in the mold within the extent that the molded body in the mold is not substantially smaller than the volume of the mold cavity and is temporarily expandable after being removed from the cavity to not more than 110% relative to the volume of the mold cavity, removing the molded body from the mold, placing the molded body into an atmosphere substantially under atmospheric pressure having a temperature 25° to 55° C. lower than the melting point of the base polyolefin resin while the volume of the molded body is 70 to 110% relative to the volume of the mold cavity, and holding the molded body in the atmosphere until the temperature of the molded body at least equilibriates with the temperature of the atmosphere.

4,631,160

METHOD OF MANUFACTURING CERAMIC SUBSTRATE FOR FINE-LINE ELECTRICAL CIRCUITRY

Richard A. Langman, Lakewood; Donald R. Giovanini, Arvada, and Michael P. Letzig, Broomfield, all of Colo., assignors to Coors Porcelain Company, Golden, Colo.

Division of Ser. No. 216,397, Dec. 15, 1980, Pat. No. 4,340,635.
This application Nov. 4, 1981, Ser. No. 318,289
Int. Cl.[4] C04B *33/32*
U.S. Cl. 264—62 9 Claims



1. A method for making a sintered monolithic ceramic substrate for fine-line electrical circuitry comprising:

(1) forming a raw ceramic batch containing as its ceramic ingredients at least 90% by weight particulate crystalline material selected from the group consisting of alumina and beryllia;

(2) forming said raw batch into a plate;

(3) firing said plate to sintering temperature thereby to form a sintered plate;

(4) coating a surface of the plate with a thin layer of ceramic containing as its ceramic ingredients at least 90% by weight particulate crystalline material substantially all of which is the same as that used in the raw batch for said plate but the average particle size of which is less than that of the crystalline material used in said raw batch for said plate; and

(5) firing said plate to sinter said layer.

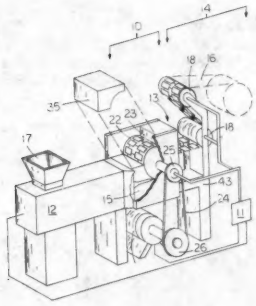
4,631,161
CONTINUOUS MOLDING METHOD

Anatoliy Popow, 6009 S. Rte 31, Crystal Lake, Ill. 60014

Division of Ser. No. 458,787, Jan. 18, 1983, Pat. No. 4,497,619. This application Feb. 1, 1985, Ser. No. 697,203

Int. Cl.⁴ B29C *47/32*

U.S. Cl. 264—167 **10 Claims**



1. A continuous molding method comprising the steps of molding products between complementary molding surfaces at least one of which is continuously moving relative to the other, at least one of said complementary molding surfaces also being configured to form a series of discrete molded products, forcing molding material in a moldable condition between the complementary molding surfaces, and continuous sliding sealing of the molding material in a molding material chamber around each of the discrete products to be molded by the complementary molding surfaces while forming continuous predetermined molding material pressure, temperature and confinement in the molding material chamber around each of the discrete products to be molded during the molding operation.

4,631,162
PROCESS FOR PRODUCING A HOLLOW IRREGULAR MULTIFILAMENT YARN

Masato Yoshimoto, and Shinji Ohwaki, both of Ibaraki, Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 692,386, Jan. 17, 1985, Pat. No. 4,546,043. This application Jun. 14, 1985, Ser. No. 745,268

Claims priority, application Japan, Jan. 18, 1984, 59-5699; Feb. 29, 1984, 59-36097

Int. Cl.⁴ D01D *5/20*

U.S. Cl. 264—167 **10 Claims**

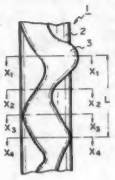
1. A process for producing a hollow, irregular, multifilament, synthetic polymer yarn capable of being converted to a bulky yarn, comprising a plurality of hollow irregular individual filaments, each of which filaments comprises:

(1) a hollow filamentary constituent having at least one hollow extending along the longitudinal axis of the filament;

(2) a non-hollow sinuous filamentary constituent sinuously extending in a wave form along the hollow filamentary constituent (1) and having an average thickness smaller than that of the hollow filamentary constituent (1); and

(3) a middle filamentary constituent distortedly extending along the hollow filamentary constituent (1) and connecting therethrough the non-hollow sinuous filamentary constituent (2) to one side of the hollow filamentary constituent (1) to provide a hollow irregular filament having a thickness varying along the longitudinal axis of the filament, and having a cross-sectional profile in the form of a waist formed between the hollow filamentary constituent (1) and the non-hollow sinuous filamentary constituent (2), said process comprising the steps of:

(A) extruding at least one fiber-forming polymer melt through a spinneret having a plurality of spinning orifices, in each of which orifices, (a) a polymer melt is extruded through a first orifice segment adequate for forming a hollow filament at a first extruding rate to form a hollow filamentary stream constituent; (b) a polymer melt is extruded through a second orifice segment adequate for



forming a non-hollow filament at a second extruding rate larger than the first extruding rate to form a non-hollow filamentary stream constituent, the first orifice segment having a size larger than that of the second orifice segment; and (c) at least one polymer melt is extruded through a third orifice segment which is in the form of a thin slit and through which the first orifice segment is connected to the second orifice segment to form the orifice body, to form a middle filamentary stream constituent, whereby the non-hollow filamentary stream constituent is caused to sinuously travel in a wave form connected to one side of the hollow filamentary stream constituent through the middle filamentary stream constituent to form a hollow irregular filamentary stream;

(B) cool-solidifying the resultant hollow irregular filamentary streams; and

(C) taking up the resultant hollow irregular filaments.

4,631,163
METHOD FOR PRODUCING A TUBULAR OBJECT OF POLYETHYLENE TEREPHALATE OR SIMILAR THERMOPLASTIC MATERIAL FROM A TUBULAR BLANK OF AMORPHOUS MATERIAL

Kjell M. Jakobsen, Skanör, and Claes T. Nilsson, Löddeköpinge, both of Sweden, assignors to PLM AB, Malmo, Sweden

Division of Ser. No. 489,750, Apr. 29, 1983, Pat. No. 4,580,968, which is a division of Ser. No. 264,665, May 18, 1981, Pat. No. 4,405,548. This application Dec. 9, 1983, Ser. No. 559,666

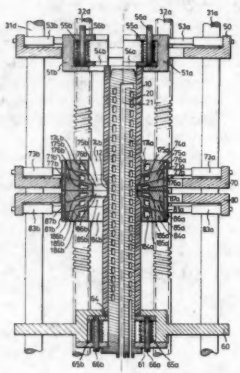
Claims priority, application Sweden, May 29, 1980, 8004003

Int. Cl.⁴ B29C *55/00*

U.S. Cl. 264—291 **25 Claims**

1. A method of forming a container body of plastic material comprising providing an elongated, tubular element of orientable plastic material, said tubular element having a wall of given thickness, engaging the wall over a portion of the thickness thereof with an annular shaping element, the engagement of the wall by the annular shaping element being continuous, applying axial force to said wall over an annular region corresponding to said portion of said thickness engaged by said shaping element, relatively displacing said elements axially of said tubular element to reduce the thickness of the tubular element substantially by the amount of said portion engaged by the shaping element while elongating said tubular element to produce crystallization of the material of the elongated element substantially with monoaxial orientation, said shaping

element being in contact with and forming a bearing surface against the plastic material in a transitional zone between the original wall thickness and the reduced wall thickness of the tubular element, and controlling the temperature of said material during thickness reduction thereof to provide a determined



temperature of the material in said transitional zone during the thickness reduction and while elongating the tubular element the combination of the elongation of the tubular element by axial movement of said transitional zone with concurrent temperature control at said transitional zone producing said crystallization with substantially monoaxial orientation.

4,631,164

NUCLEAR POWER STATION WITH A CONTAINMENT

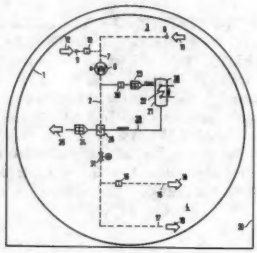
Reinhard Heck, Hanau, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim, Fed. Rep. of Germany

Continuation of Ser. No. 426,725, Sep. 29, 1982, abandoned. This application Mar. 6, 1985, Ser. No. 708,372

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3143989

Int. Cl.[4] G21C *9/00*

U.S. Cl. 376—300 **4 Claims**



1. Nuclear power station, comprising a reactor building for housing personnel during operation of the station, a containment inside said building for enclosing radioactive components having a given height and upper and lower parts, at least one pipeline being extended in vertical direction in said containment over at least half of said given height thereof from said upper part to said lower part of said containment for mixing a gas atmosphere in said containment, said at least one pipeline having an open top and bottom and an outlet in said lower part of said containment, a transporting device for mixing the gas atmosphere in said containment in the form of a blower connected in said at least one pipeline for transporting gas from said upper part to said lower part of said containment in said at least one pipeline, a recombination device in said containment having an inlet connected downstream of said blower in said at least one pipeline and an outlet for shunting said outlet of said at least one pipeline in said lower part and for targeted oxidation of free hydrogen within said containment, a heat exchanger having a primary side with a primary inlet connected to said outlet of said recombination device and a primary outlet for cooled gas, means for venting said cooled gas into said containment, said heat exchanger having a secondary side connected downstream of said inlet to said recombination device in said at least one pipeline leading to said outlet of said at least one pipeline and being shunted by said recombination device, and flame arrestors disposed upstream and downstream of said recombination device.

4,631,165

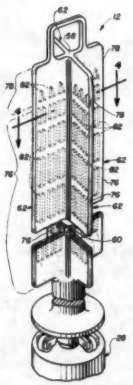
BOILING WATER REACTOR CONTROL ROD

John F. Wilson, and Pratap K. Doshi, both of Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 3, 1984, Ser. No. 637,183

Int. Cl.[4] G21C *7/10*

U.S. Cl. 376—333 **7 Claims**



1. In a control rod for a boiling water type nuclear power reactor, the improvement comprising:

(a) an elongated central stem defining a longitudinally extending internal central gas plenum;

(b) a plurality of blades connected to and extending along and radially outward from said stem, each said blade including an elongated body portion extending along said stem and terminating in an end tip portion;

(c) means defining a series of internal cavities in each of said blades, said cavities being arranged in columns and rows across the length and width of said body and tip portions of said blade;

(d) a plurality of pellets of neutron absorbing material, each disposed within one of said cavities with each of said cavities being oversized in relation to the size of said pellet disposed therein to allow extra space for swelling of said pellet, said cavities and said pellets disposed therein being arranged to define a longer, constant worth section generally coextensive with said body portion of said blade and a shorter, reduced worth section generally coextensive with said end tip portion of said blade; and

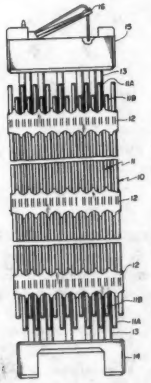
(e) means defined within each blade communicating each of said cavities with said central gas plenum for allowing any gases generated by irradiation of said pellets to expand from said cavities into said plenum.

4,631,166

HIGH UTILIZATION FUEL ASSEMBLY

Thomas M. Camden, Jr., Apollo, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 11, 1984, Ser. No. 609,251
Int. Cl.[4] G21C 3/32
U.S. Cl. 376—435 12 Claims



1. A nuclear fuel assembly comprising an array of parallel arranged guide tubes, an inlet nozzle attached to one end of said guide tubes, an outlet nozzle attached to the other end of said guide tubes, a plurality of grids having the openings therethrough attached to and spaced along the length of said guide tubes, and a plurality of parallel arranged fuel rod assemblies each having an upper end and a lower end, said fuel rod assemblies being fitted within said openings in said grids, said fuel rod assemblies being arranged axially offset relative to each adjacent fuel rod assembly and comprising an upper fuel rod and a lower axially aligned fuel rod with a gap therebetween, said gap between said fuel rods each being axially offset relative to each adjacent gap so as to eliminate an axial gap across the core.

4,631,167

METHOD FOR THE PRODUCTION OF A NUCLEAR REACTOR ASSEMBLY AND ASSEMBLY OBTAINED BY THIS METHOD

Jean-Marc Brunon, Aix en Provence, France, assignor to Commissariat a l'Energie Atomique, Paris, France

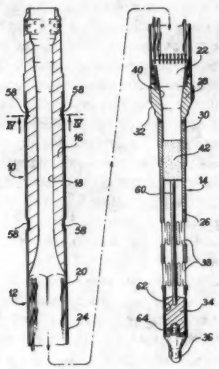
Filed Mar. 29, 1984, Ser. No. 594,719
Claims priority, application France, Apr. 8, 1983, 83 05790
Int. Cl.[4] G21C 3/32
U.S. Cl. 376—446 10 Claims

1. A method for the production of an assembly incorporating a tube having a polygonal cross-section, a bundle of rods located in said tube, an upper neutron protection part fixed to the upper end of the tube and a hollow assembly foot fixed to the lower end of the tube, wherein it comprises the following successive stages:

fixing the assembly foot and the polygonal tube by butt welding;

inspection of the thus formed weld;

introduction of the bundle of rods into the vertically positioned polygonal tube;



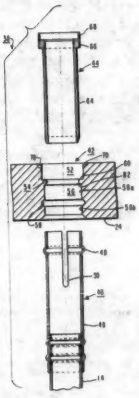
fixing the polygonal tube to the upper neutron protection part by pressing the tube into recesses formed in said part.

4,631,168

NUCLEAR REACTOR FUEL ASSEMBLY WITH A REMOVABLE TOP NOZZLE

John M. Shallenberger, Fox Chapel, and Stephen J. Ferlan, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 537,775, Sep. 30, 1983, abandoned. This application Aug. 27, 1984, Ser. No. 644,758
Int. Cl.[4] G21C 3/30
U.S. Cl. 376—446 23 Claims



1. In a fuel assembly having at least one control rod guide thimble and a top nozzle, said top nozzle including a transversely extending adapter plate, an improved attaching structure for removably mounting the top nozzle on the guide thimble comprising:

(a) means defining an outer socket in the top nozzle, said outer socket defining means including a passageway extending through said adapter plate and having a first mating element defined in said adapter plate within said passageway;

(b) means on an upper end of said guide thimble defining an inner socket, said inner socket defining means including an

elongated sleeve having an upper end portion, said upper end portion of said sleeve having a second mating element formed thereon and at least one elongated axial slot defined therein for permitting radial movement of said sleeve upper end portion between a compressed releasing position for removing and inserting said inner socket from and into said outer socket and an expanded locking position for locking said inner and outer sockets together and correspondingly permitting inward elastic collapse of said second mating element so as to allow said second mating element to enter and exit said passageway and outward elastic expansion of said second mating element so as to allow said second mating element to expand and mate with said first mating element; and

(c) a locking member inserted into said inner socket for retaining said inner socket in its locking position and thereby attachment of said top nozzle to said guide thimble, said locking member being removable from said inner socket for allowing said inner socket to be moved to its compressed releasing position and thereby detachment of said top nozzle from said guide thimble, said locking member including an elongated body portion having an outer diameter substantially equal to the inner diameter of said elongated sleeve for allowing snug fitting slidable nonthreading engagement of said locking member relative to said sleeve to a locking relation in which said locking member body portion extends through said sleeve upper end portion above and below said second mating element formed in said sleeve and through said passageway of said adapter plate.

4,631,169

ALLOYS FOR EXHAUST VALVES

Susumu Isobe; Kenkichi Matsunaga, both of Aichi; Yoshiaki Takagi, Saitama, and Norikatsu Sato, Tochigi, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha and Honda Giken Kogyo Kabushiki Kaisha, both of, Japan

Filed Apr. 2, 1985, Ser. No. 719,102

Claims priority, application Japan, Apr. 3, 1984, 59-65280

Int. Cl.[4] C22C *19/05*

U.S. Cl. 420—443 **2 Claims**

2. An alloy for use in exhaust valves consisting essentially of, by weight percentage, of 0.01～0.15% of carbon, not more than 2.0% of silicon, not more than 2.5% of manganese, 53～65% of nickel, 15～25% of chromium, 0.3～3.0% of niobium, 2.0～3.5% of titanium, 0.2～1.5% of aluminum, 0.0010～0.020% of boron, at least one element selected from the group consisting of 0.001～0.030% of magnesium, 0.001～0.030% of calcium and 0.001～0.050% of rare earth element, and the remainder being substantially iron.

4,631,170

CALCIUM-NICKEL-MISCH METAL-ALUMINUM QUATERNARY ALLOY FOR HYDROGEN STORAGE

Keizo Ohnishi, and Takatoshi Ogawa, both of Hokkaido, Japan, assignors to The Japan Steel Works, Ltd., Tokyo, Japan

Filed Aug. 5, 1985, Ser. No. 762,247

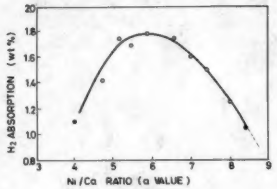
Claims priority, application Japan, Oct. 5, 1984, 59-208048

Int. Cl.[4] C01B *6/24*

U.S. Cl. 420—455 **2 Claims**

1. A calcium-nickel-misch metal-aluminum quaternary alloy for hydrogen storage that reacts with hydrogen to form a metal hydride, said alloy having the formula:

$CaNi_aMm_bAl_c$



wherein Mm is a misch metal; a, b and c are, respectively, atomic ratios of Ni, Mm and Al, with Ca taken as unity; and $5-(b+c)<a\leqq 8$, $0<b\leqq 0.4$, and $0<c\leqq 0.6$.

4,631,171

COPPER-ZINC-MANGANESE-NICKEL ALLOYS

Allen S. McDonald, Bridgeport, Conn.; Charles W. Philp, New York, and Thomas A. Sperakis, E. Elmhurst, both of N.Y., assignors to Handy & Harman, New York, N.Y.

Filed May 16, 1985, Ser. No. 734,944

Int. Cl.[4] C22C *9/04*

U.S. Cl. 420—481 **8 Claims**

1. A copper alloy composition consisting essentially of about 43 to 57 weight percent copper, about 23 to 37 weight percent zinc, about 7 to 13 weight percent manganese, about 7 to 13 weight percent nickel, and between about 0.05 and 2 weight percent silicon.

4,631,172

ALUMINUM ALLOYS FOR GALVANIC ANODE

Ikuo Yamamoto, Omiya; Takehito Umino, Hanno; Yoshio Shinoda, Ageo, and Hisao Yoshino, Kitamoto, all of Japan, assignors to Nadagawa Corrosion Protecting Co., Ltd. and Mitsui Mining & Smelting Co., both of Tokyo, Japan

Filed May 1, 1985, Ser. No. 729,256

Claims priority, application Japan, May 8, 1984, 59-91486; May 8, 1984, 59-91487

Int. Cl.[4] C22C *21/10*

U.S. Cl. 420—541 **3 Claims**

1. An aluminum alloy for a galvanic anode which contains 1.0 to 10% zinc, 0.1 to 6% magnesium, 0.01 to 0.04% indium, 0.005 to 0.15% tin 0.09 to 1.0% silicon, 0.005 to 0.45% barium or a mixture of barium and calcium, and the balance being aluminum.

4,631,173

METHOD OF STERILIZING PACKAGING MATERIAL, ESPECIALLY CONTAINER-TYPE PACKAGES

Horst Müller, Westerwaldweg 12, 4020 Mettmann, and Gerhard Deimel, Kolberger Str. 83, 5090 Leverkusen 3, both of Fed. Rep. of Germany

Continuation of Ser. No. 441,143, Nov. 12, 1982, abandoned. This application Sep. 11, 1985, Ser. No. 775,103

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145274; Sep. 24, 1982, 3235476

Int. Cl.[4] A61L *2/20*

U.S. Cl. 422—28 **6 Claims**

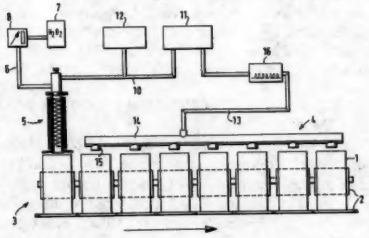
1. A method of sterilizing containers being conveyed along a path and stopped intermittently in a sterilizing station, comprising the following steps:

intermittently injecting a liquid disinfectant containing hydrogen peroxide from a nozzle when the containers stop and atomizing the disinfectant into fine droplets when the containers stop by means of an intermittent stream of compressed air to thoroughly mix the atomized sterilizing agent and the stream of compressed air,

directing the resulting combined stream onto a heated surface that has a temperature sufficient to rapidly evaporate the disinfectant in the mixed stream,

generating turbulence in the mixed stream to accelerate the droplets of disinfectant against the heated surface and to evaporate them there,

orienting the heated surface so that the resulting stream of



compressed air and vapor is diverted by the heated surface directly onto the inside of the container,

disposing the inner surface of the container at a temperature below the condensation point of the stream of compressed air and vapor,

condensing the disinfectant vapor onto the inner surface of the container, and

blowing hot air into the container to dry its inner surface.

4,631,174

MULTILAYER CHEMICAL ANALYSIS MEMBER HAVING AN OUTER WATERPROOF LAYER

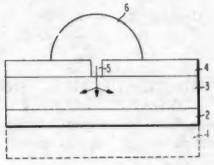
Asaji Kondo, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 614,590, May 29, 1984, abandoned, which is a continuation of Ser. No. 177,553, Aug. 13, 1980, abandoned, which is a continuation of Ser. No. 35,182, May 2, 1979, abandoned. This application Apr. 2, 1985, Ser. No. 718,976

Claims priority, application Japan, May 2, 1978, 53-59888

Int. Cl.⁴ G01N *33/52*

U.S. Cl. 422—56 **9 Claims**



1. A multilayer chemical analysis member comprising

a waterproof layer having a thickness of 8 microns to 1 mm and provided with at least one opening having a size of about 30 microns to about 4 mm in diameter for application of a sample liquid to be tested;

a porous spreading layer;

a chemical reagent layer comprising a chemical reagent in a hydrophilic or hydrophobic medium, said reagent being capable of reacting with a test material in said sample liquid; and

a support layer,

all of said layers being bonded together in a unified structure.

4,631,175

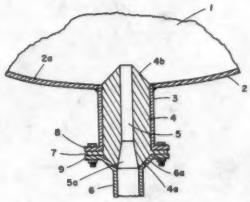
PREPARATION OF CHLORINATED POLYOLEFINS

James B. Akers, Jr., Baton Rouge, La.; Douglas E. Leng, Midland, Mich., and Randall J. Normand, Plaquemine, La., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 591,653, Mar. 20, 1984, Pat. No. 4,524,189. This application Feb. 15, 1985, Ser. No. 702,162

Int. Cl.⁴ B01J *8/10*

U.S. Cl. 422—135 **2 Claims**



1. An apparatus for contacting a particulate polyolefin or chlorinated polyolefin solid suspended in a liquid with a gas, comprising: a vessel defining an interior space and including an agitator for keeping the solid suspended in the liquid; inlet means located in a bottom wall of said vessel for introducing chlorine gas into said vessel, said inlet means including a tubular member attached at one end to said bottom wall and extending outwardly and away from the bottom wall, jet-forming means disposed in the tubular member for forming a jet of chlorine gas introduced into the vessel, said jet-forming means including a plug disposed within the tubular member, said plug having an internal passageway through which the chlorine gas is introduced into the vessel, the plug having an end defining a surface which is tapered and extends into the interior space of the vessel from an inner surface of the bottom wall, with the tapered surface of the end of the plug defining with the inner surface of the bottom wall an angle of between about 120 degrees to about 150 degrees; and means for connecting the tubular member to a chlorine gas delivery line.

4,631,176

RECOVERY OF ANHYDROUS ZINC CHLORIDE

Paul R. Kruesi, Golden, Colo., assignor to Cato Research Corporation, Wheat Ridge, Colo.

Filed Jul. 22, 1982, Ser. No. 400,947

Int. Cl.⁴ C01G *9/04*

U.S. Cl. 423—100 **25 Claims**

1. A process for stripping zinc chloride from an organic extraction agent comprising contacting the loaded extraction agent with an organic composition immiscible in the extraction agent.

4,631,177

METHOD FOR RECOVERING GALLIUM

Takao Yotsuyanagi, Miyagi, and Yoshinobu Nishiyama, Kitakyushu, both of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Jul. 2, 1985, Ser. No. 751,211

Int. Cl.⁴ C01G *15/00*

U.S. Cl. 423—112 **6 Claims**

1. A method for recovering gallium selectively from an aqueous basic solution containing gallium, which comprises dissolving 7-substituted-8- quinolinol having a C_5–C_{20} hydrocarbon group at the 7-position in a solvent, mixing the resulting solution with a porous polymer having a pore volume of from 0.3 to 1.2 ml/g, letting the solvent evaporate to obtain a porous polymer retaining substantially only the substituted quinolinol, filling a column with the polymer, passing the aqueous basic solution through the column to absorb gallium in the polymer

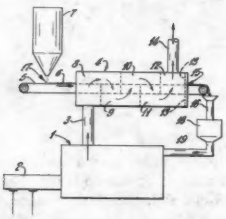
and passing an aqueous acid solution through the column to elute gallium.

4,631,178

METHOD OF REMOVING BORIC OXIDE FROM FLUE GASES

Charles F. Rapp, Newark, and Robert A. Herrick, Maumme, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 18, 1983, Ser. No. 485,972
Int. Cl.[4] B01D *47/00*
U.S. Cl. 423—210 5 Claims



1. A method of reducing the boron content of a gas stream from a glass melting furnace which comprises passing said gas stream into contact with a moving bed of sodium bicarbonate-coated glass fibers to reduce the boron content of said stream and continuously introducing the coated glass fibers into said glass melting furnace.

4,631,179

PROCESS FOR THE PRODUCTION OF SILICON CARBIDE BY THE PYROLYSIS OF A POLYCARBOSILANE POLYMER

Troy L. Smith, Jr., Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 28, 1985, Ser. No. 738,445
Int. Cl.[4] C01B *31/36*
U.S. Cl. 423—345 17 Claims

1. In a process of producing silicon carbide by pyrolysis of a polycarbosilane polymer, the improvement which comprises utilizing as the polycarbosilane polymer a moldable or shapeable poly(silmethylene) formed by polymerizing 1,3-disilacyclobutane with a ring-opening catalyst of a Group VIII element of atomic number 44 or above, in an inert liquid medium and under an inert atmosphere.

4,631,180

PROCESS FOR PRODUCING CARBON BLACK

Syushichi Yoshimura; Hiromu Kobayashi, both of Kitakyushu; Yoshikazu Toyonaga, Yamaguchi; Hozo Yamazaki, Kitakyushu, and Masanori Karatsu, Yokkaichi, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,762
Claims priority, application Japan, Sep. 21, 1984, 59-198205; Sep. 3, 1985, 60-194184
Int. Cl.[4] C01B *31/02;* C09C *1/48*
U.S. Cl. 423—450 6 Claims

1. A process for producing carbon black, comprising:

(a) generating a high temperature combustion gas stream in a first zone by the combustion of a heating fuel with an oxygen containing gas;

(b) mixing a hydrocarbon starting material with the high temperature combustion gas stream as the stream passes into a second zone, thereby forming carbon black particles; and

(c) without allowing the carbon black particles to cool, intimately contacting the carbon black particles with steam as an activating agent at a temperature of 1200°–1800° C. for a time of from 0.1–10 seconds in a third zone downstream form the second zone, thereby activating the carbon black.

4,631,181

PROCESS FOR PRODUCING MESOPHASE PITCH

Mitsuaki Matsumoto; Masatosi Furuyama; Tadao Tomioka; Hirofumi Sunago, and Masakazu Higuchi, all of Kawasaki, Japan, assignors to Nippon Steel Corporation and Nippon Steel Chemical Co., Ltd., both of Tokyo, Japan

Filed Mar. 28, 1985, Ser. No. 717,069
Claims priority, application Japan, Mar. 31, 1984, 59-64227; Mar. 31, 1984, 59-64228
Int. Cl.[4] C01B *31/02;* C09C *1/48;* C10C *1/00, 1/20*
U.S. Cl. 423—449 13 Claims

1. A process for producing a mesophase pitch for carbon products, which comprises adding one part to 200 parts by weight of at least one of an alcohol and a phenol to 100 parts by weight of heavy bitumens, subjecting the resulting mixture to pretreatment by heating at least at 250° C. under pressure, and then subjecting the pretreated mixture to heat treatment until mesophases are formed.

4,631,182

PROCESS FOR PREPARATION OF A REDUCING GAS

Peter B. Tottrup, Allerod, and Jens R. Rostrup-Nielsen, Virum, both of Denmark, assignors to Haldor Topsoe A/S, Denmark

Filed Jan. 29, 1985, Ser. No. 696,291
Claims priority, application Denmark, Feb. 1, 1984, 446/84
Int. Cl.[4] C10B *3/26*
U.S. Cl. 423—652 10 Claims

1. A process for the preparation of a reducing gas containing hydrogen and/or carbon monoxide and having a high reduction potential by catalytic conversion in two steps of a sulphur-free hydrocarbon feedstock gas having a content of hydrocarbons having two or more carbon atoms of up to 70% and a content of hydrocarbons having three or more carbon atoms at the same time of up to 40%, the percentages being calculated on basis of the number of carbon atoms, wherein, in the first step at least a part of the gas together with added steam is passed as an inlet stream through an adiabatic reactor containing a steam reforming catalyst at an inlet temperature of 440°–510° C. and an outlet temperature of 400°–500° C. and at a pressure of 1–30 kg/cm^2 g, the amount of added steam being calculated for obtaining in the inlet stream an H/C ratio of at least 4.8 and an O/C ratio of between 0.5 and 1, the outlet gas stream from the adiabatic reactor being combined with the outlet gas stream from a reduction furnace, and in the second step the combined stream is further converted by steam reforming into a reducing gas.

4,631,183

PROCESS FOR THE DESTRUCTION OF TOXIC ORGANIC PRODUCTS

Jean M. Lalancette, Sherbrooke, and Germain Belanger, St-Germain de Grantham, both of Canada, assignors to Hydro-Quebec, Quebec, Canada

Filed Jun. 25, 1985, Ser. No. 748,565
Int. Cl.[4] F23G *7/00;* C01B *21/00;* B01J *8/00;* C10H *23/00*
U.S. Cl. 423—659 14 Claims

1. Process for the destruction of toxic organic halogenated substances which comprises treating in a reaction chamber under a reductive atmosphere and heated by a member of the group consisting of resistance heating, arc heating, and induction heating at a temperature of from 1000° to 1600° C. a mixture of a toxic organic halogenated substance, carbon and a carbonate or bicarbonate of an alkali metal and generating "in situ" to cause essentially total degradation of the toxic organic halogenated substance into alkali metal halide and free carbon and carbon monoxide exit gas containing at least some free

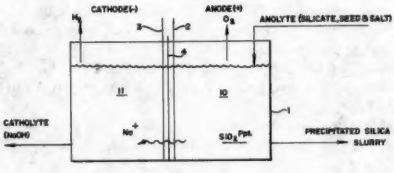
alkali metal which carbon monoxide is subsequently oxidized into carbon dioxide.

4,631,184

DIALYTIC SILICA DENTIFRICE

Milton E. Winyall, Columbia, and Cathy L. Harville, Glen Burnie, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jan. 10, 1984, Ser. No. 569,687
Int. Cl.[4] A61K 7/16
U.S. Cl. 424—49 5 Claims



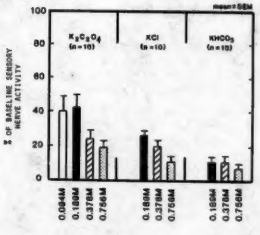
1. A dentifrice composition containing humectants, binders, preservatives, surfactants, flavoring agents, sweeteners or theraputic agents, and from about 5 to 50 percent by weight of a dialytic silica abrasive having an internal pore volume of about 0.1 to 6 cc/g, and a ratio of pore volume in pores greater than 3000 Å in diameter to pore volume in pores less than 3000 Å in diameter of greater than 1.

4,631,185

METHOD OF DESENSITIZING HYPERSENSITIVE DENTIN EMPLOYING COMPOSITIONS CONTAINING POTASSIUM SALTS

Syngcuk Kim, Orangeburg, N.Y., assignor to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Mar. 13, 1984, Ser. No. 589,163
Int. Cl.[4] A61K 7/16
U.S. Cl. 424—49 12 Claims



1. A method for reducing sensory nerve activity in a hypersensitive tooth of a subject which comprises applying to the surface of exposed dentin of the hypersensitive tooth potassium bicarbonate in an amount effective to reduce the sensory nerve activity of the hypersensitive tooth.

4,631,186

METHOD OF TREATING FINGERNAILS AND CUTICLES

Ann H. Brown, 4848 Dexter St., N.W., Washington, D.C. 20007

Continuation of Ser. No. 143,150, Apr. 23, 1980, abandoned. This application Feb. 25, 1982, Ser. No. 352,098
Int. Cl.[4] A61K 7/135, 7/021, 7/04
U.S. Cl. 424—61 10 Claims

1. A method for improving the quality and strength of nails and their cuticles consisting essentially of applying topically to the nails and cuticles an effective amount of a composition consisting essentially of sour cherry juice.

4,631,187

HAIR TREATING COMPOSITION CONTAINING A QUATERNARY AMMONIUM COMPOUND CONTAINING AN ERUCYL GROUP

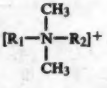
Timothy J. Padden, and Heidi J. Uick, both of Racine, Wis., assignors to S.C. Johnson & Son, Inc., Racine, Wis.

Filed Sep. 29, 1982, Ser. No. 426,460
Int. Cl.[4] A61K 7/06, 7/09
U.S. Cl. 424—70 8 Claims

1. A hair conditioning composition having good wet combing characteristics, static control and clean feel, said composition comprising:

(a) An aqueous base

(b) From about 0.5 to about 10% by weight of quaternary ammonium compound having the formula:



wherein R_1 is a mixture of C_{18} to C_{24} alkyls and C_{18} to C_{24} alkenyls, said mixture comprising at least about 65% by weight docosenyl for improved water solubility, clean feel, wet combing characteristics and good static control, less than 15% by weight docosyl and less than about 35% by weight of a mixture of C_{18} to C_{24} alkyls other than docosyl and C_{18} to C_{24} alkenyls other than docosenyl, R_2 is selected from methyl, ethyl and benzyl and A is an anion, wherein the composition has a pH within the range of 3 to 6.

4,631,188

INJECTABLE PHYSIOLOGICALLY-ACCEPTABLE POLYMERIC COMPOSITION

Vladimir A. Stoy, Princeton, N.J., and Milos Chvapil, Tucson, Ariz., assignors to S.K.Y. Polymers, Ltd. (Kingston Technologies), Dayton, N.J.

Continuation-in-part of Ser. No. 528,058, Aug. 31, 1983, abandoned. This application Aug. 31, 1984, Ser. No. 646,243
Int. Cl.[4] A61K 31/78, 31/74
U.S. Cl. 424—81 15 Claims

1. A method of in situ formation of a solid polymer in a mammal, said method comprising:

injecting into said mammal a physiologically-acceptable polymeric composition comprised of a polymeric compound dissolved in a water soluble, non-toxic polar solvent, said polymeric compound comprising a water insoluble, non-toxic non-crosslinked polymer or copolymer selected from the group consisting of polymers and copolymers of acrylonitrile, polyvinylacetate, copolymers of polyvinylacetate, linear or slightly branched polymers and copolymers of 2-hydroxyethylacrylate and methylacrylate, poly (n-vinyliminocarbonyl), polycondensates and polyadducts and having a solubility parameter of from about 9.2 to about 15.5 $(cal/cc)^{\frac{1}{2}}$.

4,631,189
N,N-DIMETHYLGLYCINE AND USE IN IMMUNE RESPONSE

Roger V. Kendall, New Haven, Vt., and Charles D. Graber, Charleston, S.C., assignors to Da Vinci Laboratories, a division of FoodScience Corporation, Essex Junction, Vt.

Continuation of Ser. No. 469,478, Feb. 24, 1983, abandoned, which is a continuation of Ser. No. 128,781, Mar. 10, 1980, Pat. No. 4,385,068. This application Apr. 9, 1985, Ser. No. 722,172
The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.
Int. Cl.[4] A61K *39/395, 31/195*
U.S. Cl. 424—85 17 Claims

1. A process for enhancing the natural immunological response of a human which comprises orally administering N,N-dimethylglycine or a pharmaceutically acceptable salt thereof to the human in an amount effective to enhance the immunological response of such human.

13. A process for producing and collecting antibody which comprises administering an antigenic substance to a non-radiation sick lower animal, administering N,N-dimethylglycine or a pharmaceutically acceptable salt thereof to the lower animal before, with or after the antigenic substance in an amount effective to enhance the immunological response of said animal to the antigenic substance and collecting antibody produced by said animal in response to said antigenic substance.

4,631,190
ACIDITY-SENSITIVE SPACER MOLECULE TO CONTROL THE RELEASE OF PHARMACEUTICALS FROM MOLECULAR CARRIERS

Wei C. Shen, 145 Richdale Rd., Needham, Mass. 02194, and Hugues J. Ryser, 503 Annursnac Hill Rd., Concord, Mass. 01742

Filed Jun. 26, 1981, Ser. No. 277,633
Int. Cl.[4] A61K *39/44*
U.S. Cl. 424—85 20 Claims

1. A method of employing a first molecule and a second molecule to transport a third molecule through a first region to a second region that is more acidic than said first region, and to release said third molecule from said first and second molecules in said second region, comprising the following steps:

a. selecting at least one first molecule that is capable of increasing the transport of other molecules from said first region to second region;

b. selecting at least one second molecule comprising an alkene with multiple attached moieties, at least two of which are acidic moieties attached to said alkene in a cis configuration;

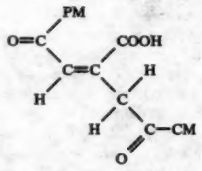
c. selecting at least one third molecule that is capable of performing at least one useful function at said second region;

d. bonding said third molecule to one of said acidic moieties that is attached to said second molecule in a cis configuration;

e. bonding said first molecule to said second molecule through a moiety that is not attached to said second molecule in a cis configuration with another acidic moiety;

f. introducing said molecular conjugate into said first region.

20. A molecular conjugate that is spontaneously hydrolyzed when ingested by a cell, comprising the following structural formula:



where PM comprises a drug and CM comprises a molecule which is readily ingested into cells or which specifically attaches to a substance on the surface of a cell.

4,631,191
METHODS AND COMPOSITIONS USEFUL IN PREVENTING EQUINE INFLUENZA

Beverly Dale, Sunnyvale, and Barbara Cordell, San Francisco, both of Calif., assignors to Biotechnology Research Partners, Ltd., Mountain View, Calif.

Filed Jun. 20, 1985, Ser. No. 747,020
Int. Cl.[4] A61K *39/00, 39/12;* C07K *7/08, 7/10*
U.S. Cl. 424—88 4 Claims

1. A peptide useful in preparing a vaccine against equine influenza which comprises an amino acid sequence selected from the group consisting of:

Ala-Cys-Arg-Arg-Ser-Arg-Ser-Ser-Phe-Tyr-Ala-Glu-Met-Lys-Trp-Leu-Leu-Ser-Asn-Thr-Asp-Asn-Gly-Val-Phe-Pro-Gln-Met;

Cys-Lys-Arg-Glu-Pro-Ala-Leu-Ile-Ile-Trp-Gly-Ile-His-His-Ser-Gly-Ser-Thr-Ala-Glu-Gln-Thr-Arg-Leu-Tyr-Gly-Ser-Gly-Asn-Lys-Cys;

Arg-Ala-Ile-Gly-Lys-Cys-Pro-Arg-Tyr-Val-Lys-Gln-Lys-Ser-Leu-Met-Leu-Ala-Thr-Gly-Met-Lys-Asn-Val-Pro-Glu-Asn-Ser-Thr;

Thr-Gly-Val-Thr-Gln-Asn-Gly-Arg-Ser-Gly-Ala-Cys-Arg-Arg-Gly-Ser-Ala-Ser-Arg;

Lys-Leu-Tyr-Ile-Trp-Gly-Ile-His-His-Pro-Ser-Thr-Asn-Asn-Glu-Gln-Thr-Lys-Leu-Tyr-Ile-Gln-Glu-Ser-Gly-Arg-Val-Thr;

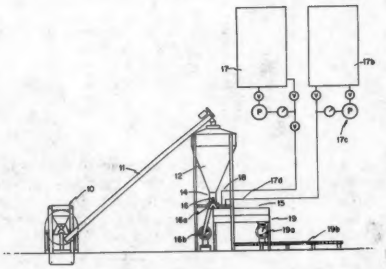
Lys-Tyr-Ile-Lys-Gln-Asn-Thr-Leu-Lys-Leu-Ala-Thr-Gly-Met-Arg-Asn-Val-Pro-Glu-Lys-Gln-Ile; and

Gly-Ile-Phe-Gly-Ala-Ile-Ala-Gly-Phe-Ile-Glu-Asn-Gly-Lys-Lys.

4,631,192
CONTINUOUS-FLOW PROCESS FOR MAKING A HARDENED ANIMAL FEED COMPOSITION

Richard P. Mommer, Loveland, and Johnny M. Thomas, II, Fort Collins, both of Colo., assignors to Uniscope, Inc., Johnstown, Colo.

Continuation-in-part of Ser. No. 204,627, Nov. 6, 1980, abandoned. This application Dec. 20, 1984, Ser. No. 683,857
Int. Cl.[4] A23K *1/22;* A23N *17/00*
U.S. Cl. 426—69 15 Claims



1. A continuous-flow process for making a hardened animal feed composition comprising the steps of:

(a) continuously feeding solid ingredients comprising calcium oxide into a mixer;

(b) continuously feeding liquid ingredients comprising molasses into a mixer, wherein the molasses weight is from equal to 22 times the calcium weight;

(c) metering the solid and liquid ingredients from the mixers into a continuous-flow mixer, wherein the solid and liquid ingredients are mixed for a period of from about one-half

to about ten minutes to produce a homogeneous animal feed composition; and

(d) discharging the homogeneous animal feed composition from the continuous-flow mixer into a shaping device to form a hardened animal feed composition.

4,631,193

TREATING BEER TO PREVENT CHILL HAZE

Michael T. Sobus, Philadelphia, Pa., assignor to PQ Corporation, Valley Forge, Pa.

Continuation-in-part of Ser. No. 674,802, Nov. 26, 1984, abandoned. This application Aug. 26, 1985, Ser. No. 769,034

Int. Cl.[4] C12H *1/02*

U.S. Cl. 426—330.4 **12 Claims**

1. A composition for treating beer to prevent chill haze consisting of 0.2 to 4.0 parts by weight (pbw) of gelatin and 100 pbw of a silica gel.

4,631,194

ESTERS OF ALKYLTHIOALKANOIC ACIDS

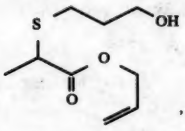
Thomas F. Courtney, Jr., Keyport; Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven; Manfred H. Vock, Locust, and Charles Wiener, Middletown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

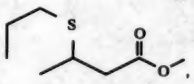
Filed Dec. 6, 1985, Ser. No. 789,162

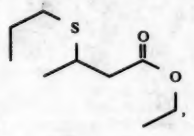
Int. Cl.[4] A23L *1/226, 1/231, 1/235*

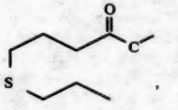
U.S. Cl. 426—535 **12 Claims**

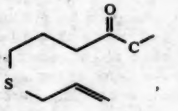
1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to said foodstuff from about 0.001 ppm up to about 250 ppm by weight of said foodstuff of an ester of alkylthioalkanoic acid selected from the group consisting of











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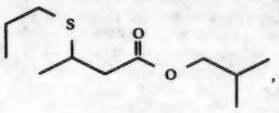

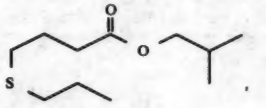

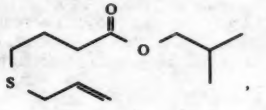

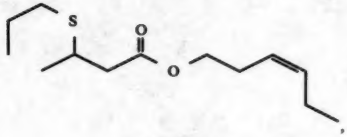

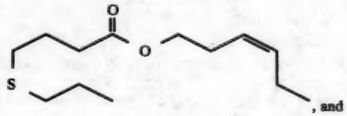

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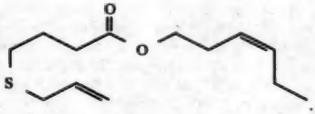


4,631,195

SWEETENING COMPOSITION

John A. Colliopoulos, 1114 Dobson, Evanston, Ill. 60202; James G. Young, 2729 Oak Ave., Northbrook, Ill. 60062, and Josef H. Tsau, 876 Crimson Ct., Prospect Heights, Ill. 60070

Continuation of Ser. No. 661,539, Oct. 16, 1984, which is a continuation of Ser. No. 395,423, Jul. 6, 1982, abandoned. This application Jun. 21, 1985, Ser. No. 747,200

Int. Cl.[4] A23L *1/22, 1/236*

U.S. Cl. 426—548 **8 Claims**

6. An improved cooked or baked foodstuff comprising a high caloric sweetener, flour or other starchy material wherein the improvement comprises replacing all or part of the high caloric sweetener, flour or other starchy material with a composition comprising a dipeptide sweetener and a polyglucose or polymaltose in a ratio of from about 1:40 to about 1:200.

4,631,196

LOW CALORIE DAIRY PRODUCT

Clifford L. Zeller, 11628 North Shore Cliff La., Mequon, Wis. 53092

Filed Apr. 15, 1985, Ser. No. 723,319

Int. Cl.[4] A23C *9/154, 9/20*

U.S. Cl. 426—580 **10 Claims**

1. A low cholesterol, low calorie, no-fat dairy product, consisting essentially of, in unflavored form, a blend of water, a no-fat protein-containing material selected from the group

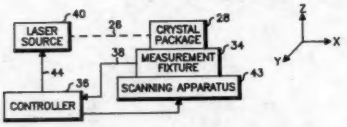
consisting of skim milk and cultured skim milk, sugars consisting of a mixture of 10% to 90% polydextrose and 90% to 10% fructose, milk-derived solids, stabilizers and emulsifiers, said water accounting for up to about 40% by weight of the product, said no-fat protein-containing material accounting for about 30% to 70% by weight of the product and having a total milk solids content of about 20% to about 25% by weight said sugars accounting for about 5% to 30% by weight of the product, said milk-derived solids accounting for about 2% to 8% by weight of the product, and said stabilizers and emulsifiers accounting for about 0.2% to 2.5% by weight of the product.

4,631,197

APPARATUS AND METHOD FOR ADJUSTING THE FREQUENCY OF A RESONATOR BY LASER

Jeffrey A. DeFreese, Mount Prospect, and Theodore E. Lind, Lombard, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 17, 1985, Ser. No. 755,885
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—10 **21 Claims**



1. An improved crystal resonator device, comprising:
a crystal resonator;
a base constructed and arranged to receive said crystal resonator;
at least two terminal leads extending through said base electrically connected to said crystal resonator; and
a cover having at least one transparent area with an effective amount of plating material deposited thereon forming a layer having at least one goemetrically shaped surface;
whereby, said geometrically shaped surface operates to control the vaporization of said plating material.

14. A method for fabricating a crystal resonator to a specified operating frequency, comprising the steps of:
mounting the crystal resonator within a housing having at least one transparent area with an effective amount of plating material deposited thereon;
shaping said plating material such that at least one geometrically shaped surface is formed thereon;
measuring the operating frequency of the crystal resonator; and
vaporizing said plating material with a laser beam such that the vaporization pattern of said plating material is controlled by said geometrically shaped surface thereby adjusting the crystal resonator's operating frequency.

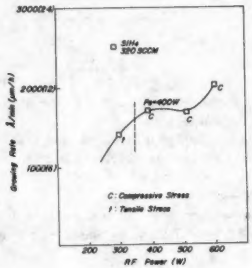
4,631,198

METHOD OF MANUFACTURING THIN AMORPHOUS SILICON FILM

Hiroaki Kakinuma; Satoshi Nishikawa, and Tsukasa Watanabe, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 606,095, May 2, 1984, abandoned. This application Jul. 26, 1985, Ser. No. 759,194
Claims priority, application Japan, May 16, 1983, 58-84121
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—38 **6 Claims**

1. A method of manufacturing thin amorphous silicon hydride film by a plasma CVD process comprising the steps of providing a substrate for supporting the amorphous silicon hydride film, providing raw material gas produced by mixing hydrogen silicide $Si_nH_{2n+2}(n \geqq 1)$ with additive gas in the concentration from about 0.1 to 10 parts per million by volume, setting a gas flow rate of the raw material gas in the range from about 200 to about 700 SCCM, applying radio frequency electric power to said gas in plasma CVD apparatus, said



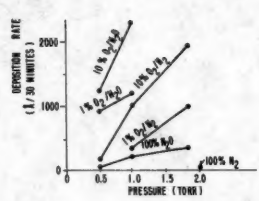
power being selected in the range from about 300 W to about 700 W to result in a ratio of electric power in watts to gas flow rate in SCCM of at least about 1, and growing thin amorphous silicon hydride film on the substrate from the raw material gas.

4,631,199

PHOTOCHEMICAL VAPOR DEPOSITION PROCESS FOR DEPOSITING OXIDE LAYERS

James T. Hall, Redondo Beach, and John W. Peters, Malibu, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 22, 1985, Ser. No. 757,562
Int. Cl.[4] C23C *16/50*
U.S. Cl. 427—54.1 **4 Claims**



1. A photochemical vapor deposition process for depositing a layer of an oxide of a chosen material on the surface of a selected substrate comprising the steps of:
(a) providing said substrate; and
(b) exposing said substrate to a selected vapor phase reactant and an oxygen-containing precursor comprising a mixture of nitrous oxide admixed with molecular oxygen in a predetermined ratio, in the presence of radiation of a selected wavelength sufficient to cause the direct dissociation of said oxygen-containing precursor to form neutral oxygen atoms that react with said vapor phase reactant and form said oxide which deposits as said layer on said substrate, wherein the rate of reaction to form and deposit said oxide is enhanced by said molecular oxygen in said mixture.

4,631,200

GRAPHITE COMPOSITE CHIPS

Thomas R. Bierschenk, Round Rock, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 17, 1985, Ser. No. 734,996
Int. Cl.[4] B05D *3/02, 5/12*
U.S. Cl. 427—113 8 Claims

1. A method for making composite chips for use in packed bed electrolytic cells featuring a uniform coating of carbon and Teflon on graphite chips wherein the method comprises:

(a) preliminarily washing particulate carbon with a metal removing wash;

(b) mixing the washed particulate carbon with a fluorocarbon dispersion in water and adding thereto graphite chips having a specified mesh;

(c) removing the water until dry; and

(d) sintering the dried material at an elevated temperature for a specified interval wherein the coating material is applied to an average thickness of about 90 microns on about 95% or more of the graphite chips so treated.

4,631,201

METHOD FOR INSULATING A MAGNET WIRE WITH TETRAALKYL TITANATE MODIFIED NYLON

Francois A. Lavallee, Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Division of Ser. No. 732,534, May 10, 1985, Pat. No. 4,599,387.
This application Sep. 23, 1985, Ser. No. 778,832
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—118 4 Claims

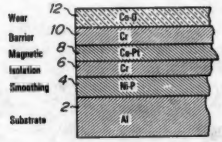
1. A method of coating a magnet wire substrate comprising applying to an electrically conductive wire substrate at least one layer of an enamel composition comprising nylon reacted with 0.5% to 3.5% by weight based on the weight of the nylon present in the enamel composition of a tetraalkyl titanate.

4,631,202

THIN FILM MAGNETIC RECORDING FILM

James E. Opfer, Palo Alto, and Bangalore R. Natarajan, San Jose, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 549,331, Nov. 3, 1983, Pat. No. 4,610,911.
This application Apr. 21, 1986, Ser. No. 853,870
Int. Cl.[4] H01F *10/02*
U.S. Cl. 427—131 30 Claims



1. A method of providing a film of an alloy of cobalt and platinum having certain magnetic properties comprising:

(a) forming a layer of chromium on a substrate;

(b) depositing said film of said alloy of cobalt and platinum on said layer of chromium;

(c) forming said film to a predetermined thickness to obtain a predetermined magnetization-thickness product thereof; and

(d) setting the percentage of platinum of said alloy to obtain a predetermined coercivity, said percentage of platinum ranging from about 1 to about 20 atomic percent.

4,631,203

LATENT IMAGING AND DEVELOPER SYSTEM

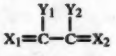
Rolf Schaefer, Im Brueggli 12, CH-4422 Arisdorf, Switzerland, and Haywood A. Walker, Jr., Box 432 D, Rte. 1, Liberty, Mo. 64068

Filed Apr. 8, 1985, Ser. No. 720,759
Int. Cl.[4] B41M *5/12*
U.S. Cl. 427—145 23 Claims

1. A method of imaging a substrate with a concealed image, and subsequently developing the concealed image to render the same visible, said method comprising the steps of:

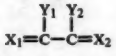
imaging said substrate with a printing material having therein a dissociable salt of a transition metal, said material being characterized by the properties of being invisible to the naked eye when applied to said substrate, and remaining invisible to the naked eye on the substrate under normal ambient conditions for a period of at least about three months;

thereafter visually developing said invisible image by applying thereto a liquid developer substance, said developer comprising a color precursor compound selected from the group consisting of dithiooxalic acid and compounds of the formula



wherein X_1 and X_2 are respectively taken from the group consisting of NH and N—R_1, R_1 being an alkyl group of from 1 to 4 carbon atoms, inclusive, and Y_1 and Y_2 are respectively taken from the group consisting of SH and S—R_2, R_2 being an alkyl group having from 1 to 4 carbon atoms, inclusive, said precursor compound being dispersed in a carrier for dissociating said salt into dissociated transition metal cation and salt-forming anions, and for maintaining said color precursor compound in a solubilized state in the presence of the dissociated salt for permitting a color reaction to take place between said dissociated transition metal cation and said solubilized color precursor compound.

16. A liquid developer for use in developing an invisible image on a substrate, said image including therein a dissociable salt of a transition metal, said developer comprising a color precursor compound selected from the group consisting of dithiooxalic acid and compounds of the formula.



wherein X_1 and X_2 are respectively taken from the group consisting of NH and N—R_1, R_1 being an alkyl group of from 1 to 4 carbon atoms, inclusive, and Y_1 and Y_2 are respectively taken from the group consisting of SH and S—R_2, R_2 being an alkyl group having from 1 to 4 carbon atoms, inclusive, said precursor compound being dispersed in a carrier comprising water and a surfactant for dissociating said salt into dissociated transition metal cation and salt-forming anion, and for maintaining said color precursor compound in a solubilized state in the presence of the dissociated salt for permitting a color reaction to take place between said dissociated transition metal ion and said solubilized color precursor compound.

4,631,204

PROCESS OF PRODUCING COLOR DEVELOPER SHEET FOR PRESSURE-SENSITIVE RECORDING

Hirofumi Mitsuo, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 10, 1984, Ser. No. 608,833
Claims priority, application Japan, May 10, 1983, 58-81524
Int. Cl.[4] B41M *5/22*
U.S. Cl. 427—150 12 Claims

1. A process for producing a color developer sheet for pressure-sensitive recording comprising mixing a coating liquid containing a metal salt of an aromatic carboxylic acid and an aqueous emulsion of an organic solvent and coating the resulting mixture on a support, wherein the organic solvent is a biphenyl derivative or a diphenylalkane having a boiling point of about 150° C. to about 315° C. and dissolves the metal salt of the aromatic carboxylic acid in such an amount that the metal salt of the aromatic carboxylic acid has a solubility in the organic solvent of 10 or more at 25° C.

4,631,205

PROCESS FOR PRODUCING COHERENT FILMS OF POLYACETYLENE

John W. Eveleigh, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Bartlesville, Mass.

Filed Oct. 11, 1984, Ser. No. 659,900
Int. Cl.[4] C23C *16/00*
U.S. Cl. 427—255.6 13 Claims

1. A process for producing coherent films of polyacetylene, comprising:

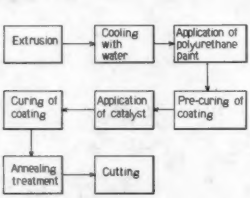
contacting at about −80° C. a chemically inert support with an acidic, active catalyst solution having a pH of 5 or below comprising a transition metal salt, polar medium, water and a borohydride to produce a catalytically active surface; and exposing at a temperature from about −80° C. to about −20° C. the catalytically active surface to acetylene gas whereby coherent films of polyacetylene adherent to the support are produced.

4,631,206

METHOD FOR CURING POLYURETHANE COATING

Akira Mabuchi, Nagoya; Kenji Yano, and Hisashi Mizuno, both of Inazawa, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jul. 25, 1985, Ser. No. 758,828
Claims priority, application Japan, Jul. 30, 1984, 59-161313
Int. Cl.[4] B05D *3/02*; C09J *3/14, 3/16*
U.S. Cl. 427—340 5 Claims



1. A method for curing a polyurethane coating, comprising the steps of:

(1) applying a polyurethane paint containing isocyanate prepolymer at a stated position on the surface of a substrate,

(2) applying a catalyst (cure accelerator) on the uncured polyurethane coating formed in the preceding step (1), and

(3) subsequently curing said polyurethane coating in a heating atmosphere of 60° to 100° C.

4,631,207

SILOXANE COMPOSITIONS AND PROCESS FOR TREATMENT OF MATERIALS

John G. C. Price, Barry, Wales, assignor to Dow Corning Ltd., Barry, Wales

Filed Dec. 13, 1985, Ser. No. 808,772
Claims priority, application United Kingdom, Dec. 22, 1984, 8432570
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—387 11 Claims

1. Compositions comprising (1) a component selected from the group consisting of mixtures and reaction products of (A), a polydiorganosiloxane having a molecular weight of at least 350 and at least one silicon-bonded —OX group, wherein X represents a group selected from a hydrogen atom, an alkyl group or an alkoxyalkyl group, the said polydiorganosiloxane having at least one silicon-bonded substituent selected from aminoalkyl and polyaminoalkyl acid salt groups derived from a water-soluble organic or inorganic acid, at least 0.5% by weight of the polydiorganosiloxane being provided by amino nitrogen, at least 40% of the total number of silicon-bonded substituents in the polydiorganosiloxane being methyl groups and any remaining substituents being monovalent hydrocarbon groups having from 2 to 10 carbon atoms, and (B) a silicon compound which is soluble in (2) and which has per molecule more than 2 silicon-bonded groups reactive with the —OX groups in (A), and (2) a water-soluble solvent for (A) which comprises at least one glycol ether of the formula $C_4H_9—O—(CH_2—CH_2—O)_nH$, where n has a value of 1 or 2.

4,631,208

ORGANOSILOXANE-OXYALKYLENE COPOLYMERS

Stephen Westall, Barry, Wales, assignor to Dow Corning, Ltd., Barry, Wales

Filed Oct. 28, 1985, Ser. No. 791,956
Claims priority, application United Kingdom, Nov. 9, 1984, 8428401
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—387 8 Claims

1. An organosiloxane-oxyalkylene copolymer wherein a silicon atom of at least one organosiloxane unit has attached thereto a group represented by the general formula

$$—X(OR)_nOSiR'_a(OR'')_{3-a}$$

wherein X represents a divalent hydrocarbon group having from 2 to 8 inclusive carbon atoms, R represents an alkylene group having from 2 to 4 inclusive carbon atoms, n is an integer of at least 2, R' represents a group selected from the group consisting of alkyl groups having from 1 to 8 inclusive carbon atoms, the vinyl group, the allyl group and the phenyl group, R'' represents an alkyl or an alkoxyalkyl group having less than 7 carbon atoms and a has a value of 1 or 2, the remaining silicon-bonded substituents in the organosiloxane units being selected from hydrogen atoms, monovalent hydrocarbon groups and groups represented by the general formula

$$—X(OR)_nOG$$

wherein X and R are as hereinabove defined and G is a substituent selected from the group consisting of the hydrogen atom, monovalent hydrocarbon groups having from 1 to 10 inclusive carbon atoms and acyl groups having from 2 to 6 inclusive carbon atoms, at least 40 percent of the total substituents bonded to siloxane silicon atoms in the copolymer being methyl.

4,631,209

MANUFACTURE OF ASBESTOS-FREE FRICTION FACING MATERIAL

Ralph Baker, Buxton; Eric T. Smith, New Mills; Vaughan T. Dickinson, Whitworth; Noel C. McKenzie, Rochdale, and Brian Hargreaves, Flixton, all of England, assignors to Ferodo Ltd. and T&N Research Ltd., both of Manchester, England

Filed Aug. 8, 1985, Ser. No. 763,782

Claims priority, application United Kingdom, Aug. 30, 1984, 8421915

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—392 2 Claims

1. In a method of making asbestos-free friction facing material suitable for operation in oil, in the form of a fibrous sheet whose fibers consist essentially of cellulosic fibers and which contains friction-imparting particles and particles of friction modifier, the sheet containing a thermosetting phenolic resin which after curing binds the ingredients firmly together, said method comprising preparing a water-laid sheet by a paper-making process from an aqueous suspension of cellulosic fibers and other sheet forming ingredients,

the improvement comprising in (1) employing as the cullulosic fibers a mixture of cotton fibers and refined cellulose pulp, and (2) including the thermosetting phenolic resin in emulsified from in the aqueous suspension from which the sheet is laid.

4,631,210

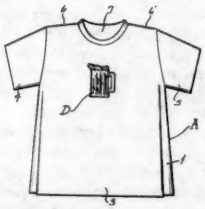
LIQUID-CONTAINING DECORATIVE DEVICE

Theodore W. McGee, 2810 W. Logan Blvd., Chicago, Ill. 60647; Charles Muncy, St. Louis County, Mo., and John E. Suerth, Glenview, Ill., assignors to Theodore W. McGee, Chicago, Ill.

Filed Aug. 12, 1985, Ser. No. 764,772

Int. Cl.[4] B44C *5/04*

U.S. Cl. 428—13 17 Claims



1. A decorative device for use in conjunction with garments of natural or synthetic fabrics or combinations thereof comprising front and back normally flat sheets of transparent, fluid impervious, plastic material disposed in flatwise registering relationship, means securing said front and back sheets, one to the other, in the marginal zones thereof for developing a central chamber or volume therebetween, liquid provided within said chamber being of predetermined coloration for visual display through said front sheet, and means securing said marginally joined sheets upon the selected garment.

4,631,211

MEANS FOR SEQUENTIAL SOLID PHASE ORGANIC SYNTHESIS AND METHODS USING THE SAME

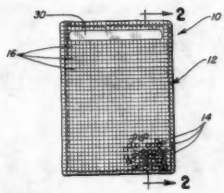
Richard A. Houghten, Solana Beach, Calif., assignor to Scripps Clinic & Research Foundation, La Jolla, Calif.

Filed Mar. 25, 1985, Ser. No. 715,654

Int. Cl.[4] D03D *1/04;* B65D *33/01;* C08F *283/00*

U.S. Cl. 428—35 40 Claims

1. A means for carrying out a sequential, solid phase organic synthesis to form a reaction product containing a plurality of reacted subunits comprising an immersible mesh packet having enclosed therein a free form aliquot of reactive particles, said particles being of a size that is larger than any of the foraminae defined by said mesh packet and having a known amount of organic synthesis reactive functionality covalently linked to said particles, said reactive functionality being capable of reacting during said organic synthesis, said mesh packet and said particles being substantially insoluble in water and in organic solvents.



4,631,212

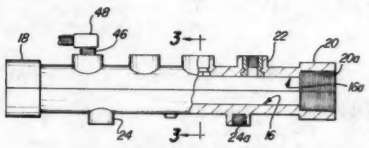
MANIFOLD

David C. Shifflett, and Dennis I. Shifflett, both of Mt. Clemens, Mich., assignors to Al-Ko Products, Inc., Fraser, Mich.

Filed May 1, 1985, Ser. No. 729,234

Int. Cl.[4] F16I *15/00*

U.S. Cl. 428—36 4 Claims



1. A manifold comprising:

(A) a plastic member including an elongated tubular portion having a generally cylindrical bore, means defining a longitudinally extending flatted surface on the inside of said tubular portion, and a plurality of transverse bores extending transversely through the wall of said tubular portion at longitudinally spaced locations therealong and opening at their inner ends in said flatted surface and at their outer ends in an exterior surface of said plastic member;

(B) a metal tubular insert, including a flat polygonal head portion having a flat annular end surface and a tubular body portion, received in each transverse bore with the central axis of the insert generally perpendicular to the central axis of said tubular portion and said flat annular end surface of said polygonal head portion flush mounted in said flatted surface; and

(C) thread means on the interior of each insert for receipt of a threaded member therein.

4,631,213

THERMOFORMED SHEET FOR A PLATE-TYPE GAS-GAS HEAT EXCHANGER AND THE EXCHANGER INCLUDING SAID SHEET

Georges J. P. E. Bosne, Viroflay, France, assignor to Hamon-Industries, Paris, France

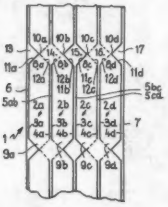
Filed Jul. 19, 1985, Ser. No. 757,128

Int. Cl.[4] B32B *3/28*

U.S. Cl. 428—53 5 Claims

1. A thermoformed sheet (1 ; 101) for a plate type gas-gas heat exchanger of the type comprising a case (40 ; 60) in which are stacked parallel plates spaced apart from each other by lateral spacing means, these plates having at their ends pointed regions provided with elements for alternately closing one of the two sides of the pointed regions, the case further compris-

ing walls connected in a fluidtight manner to the points of the ends of the plate so as to form distinct inlet and outlet conduits for the gases which circulate in a countercurrent manner in the alternating spaces formed by the plates, this sheet comprising a series of identical rows of elongated patterns (*2a*, *2b*, *2c*, *2d*; *102a*, *102b*, *102c*, *102d*) having folded edge portions on one side or the other of the sheet, each pattern having two parallel longitudinal edge portions (*3a*, *4a*; *3b*, *4b*; *3c*, *4c*; *3d*, *4d*; *103a*,



104a; *103b*, *104b*; *103c*, *104c*; *103d*, *104d*) by which it is connected to adjacent patterns so as to form a row and terminating in two pointed end portions (*8a*, *9a*; *8b*, *9b*; *8c*, *9c*; *8d*, *9d*; *110a*, *111a*; *110b*, *111b*; *110c*, *111c*; *110d*, *111d*) by which the patterns of a row are connected to the patterns of the following row, the intermediate regions (**13**, **14**, **15**, **16**, **17**; **112**, **113**, **114**, **115**, **116**) existing between these rows projecting alternately on one side and the other of the sheet (**1**, **101**).

4,631,214

TRANSPARENT ELECTROMAGNETIC WAVE SHIELDING MATERIAL

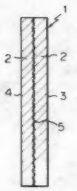
Hiroaki Hasegawa, Fukui, Japan, assignor to Fukuvi Chemical Industry Co., Ltd., Fukui, Japan

Filed Dec. 23, 1985, Ser. No. 812,573

Claims priority, application Japan, Dec. 24, 1984, 270728; Mar. 29, 1985, 44832; Mar. 29, 1985, 63923

Int. Cl.[4] **H05K** *9/00*; **B32B** *3/30, 15/08, 27/12*

U.S. Cl. 428—68 **11 Claims**



1. A transparent electromagnetic wave shielding material comprising a molded body of a synthetic resin composed mainly of diethylene glycol bisallyl carbonate and a blackened electroconductive fiber gauze embedded therein.

4,631,215

EXTRUDED ARTICLE AND METHOD OF MAKING THE SAME

Dennis G. Welygan, Cottage Grove, and Ronald O. Zemke, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 550,641, Nov. 10, 1983, abandoned. This application Oct. 15, 1985, Ser. No. 788,091

Int. Cl.[4] **B32B** *3/28, 3/30*

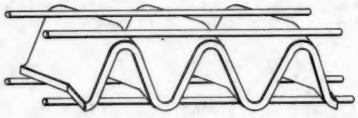
U.S. Cl. 428—105 **31 Claims**

1. An article comprising a plurality of straight continuous spaced parallel extruded elements, each of said extruded elements comprising a plurality of filaments, said extruded elements being separated by a regularly folded undulated extruded element having an aspect ratio of at least 2 with undulations having opposed apexes on either side thereof, with apexes on one side of said undulated element being bonded to said filaments of said straight continuous parallel extruded elements and apexes on the other side of said undulated element being bonded to another set of filaments comprising said straight continuous parallel extruded element.

17. An article prepared by a method comprising:

(1) extruding at a first rate a first filament-forming, extrudable plastic means to form a plurality of spaced, straight continuous parallel elements;

(2) extruding simultaneously, at a second rate faster than said first extrusion rate and between adjacent spaced, continuous parallel elements, a second filament-forming extrudable plastic mass to form an undulatable element which is thinner than it is wide to provide a cross-section with an aspect ratio of at least two, with the undulatable element being positioned with each opposite face of its wide dimension facing one of said continuous straight parallel elements, the surfaces of said plastic masses having a tacky first physical state which permits said surfaces to bond to one another at points of mutual contact and a second



physical state in which subsequent bonding will no longer occur and in which latter state said elements have sufficient structural integrity to maintain their extruded bonded shape;

(3) while the surfaces of said elements are sufficiently tacky to simultaneously cause bonding therebetween at points of contact, causing said undulatable element to undulate in its thin dimension by permitting contact between a parallel element on one side of said undulatable element to form an apex while maintaining the other adjacent parallel element in sufficiently close proximity to permit subsequent contact between it and the undulating undulatable element to form an opposed apex and to permit repetition of such undulation and subsequent contact to form a plurality of apexes, thereby providing an article having an undulated element with apexes aligned on opposed sides wherein the apexes on one side of the undulated element are bonded to one of said parallel elements and the apexes on the other side of said undulated element are bonded to the other adjacent parallel element; and

(4) changing or permitting the change of said plastic masses to said second physical state.

4,631,216

LARGE-SURFACE AREA CONTROL PANEL

Stig Olofsson, Televerkets Industridivision, Box 1001, S-149 01 Nynäshamn, Sweden

Filed Nov. 13, 1984, Ser. No. 670,723

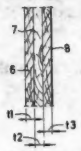
Claims priority, application Sweden, Nov. 16, 1983, 8306315

Int. Cl.[4] **B32B** *5/12, 3/02, 21/04*

U.S. Cl. 428—106 **4 Claims**

1. A large-surface area control panel comprising a major portion made of a large piece of solid wood having a first thickness and a remaining portion of a second reduced thickness, said reduced thickness being in the range of from about 1.5 mm to about 6 mm, said control panel at least in said second thickness portion consisting of a plurality of sheets of wood

positioned in face-to-face contact with each other, wherein the number of said sheets is uneven and wherein the directions of



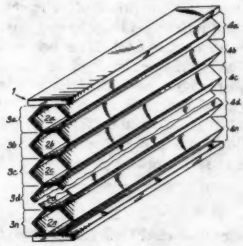
the grain of wood in two adjacent sheets run cross-wise to each other.

4,631,217

HONEYCOMB STRUCTURE WITH Z-FOLDED MATERIAL AND METHOD OF MAKING SAME

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas Inc., Totowa, N.J.

Filed Oct. 25, 1985, Ser. No. 791,239
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—118 **12 Claims**



1. In an expandable honeycomb structure constructed of foldable material and defined by a plurality of longitudinally extending cells, one on top of the other, each cell having a longitudinally extending front face and a longitudinally extending back face, any one cell intermediate the end cells having a first and second adjacent cell, the improvement wherein:

(a) the front face of any one cell, intermediate the end cells, and the back face of the first adjacent cell is defined by a first piece of material; and

(b) the back face of said any one cell and the front face of the second adjacent cell is defined by a second piece of material.

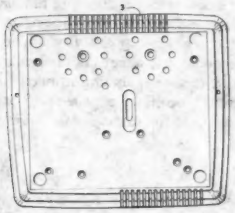
4,631,218

WOODEN BASE PLATE

Stig Olofsson, Televerkets Industridivision, Box 1001, S-149 01 Nynäshamn, Sweden

Filed Nov. 13, 1984, Ser. No. 670,724
Claims priority, application Sweden, Nov. 16, 1983, 8306316
Int. Cl.[4] B32B *3/10, 3/02;* H04M *1/05;* B05D *3/02*
U.S. Cl. 428—131 **3 Claims**

1. A plate, for an apparatus made of wood, said plate having an upwardly projecting peripheral rim and slots located on the edge of said rim, wherein said plate comprises a first, flat component made of wood and a second component connected to said flat component to form said upwardly projecting rim, said second component made of solid wood and comprising a composite frame having at least three parts, wherein a plank of solid wood from which each of the frame parts has been made has first been subjected to drying to a moisture content of about 4 to 5% and has then been heat-treated whereby pith fibers of the wood are sealed by resin released from said wood and is further surface treated with varnish for sealing the surface pores of the wood, and wherein each part of said frame is so arranged that the grain of the wood coincides essentially



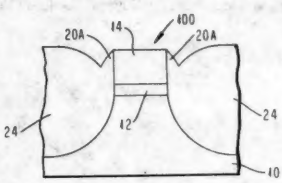
with the height direction of the plate, and wherein said plate further comprises a reinforcing element next to the free end edge of said frame part for preventing warping in the wood caused by internal stresses.

4,631,219

GROWTH OF BIRD'S BEAK FREE SEMI-ROX

Henry J. Geipel, Jr., and Pai-Hung Pan, both of Essex Junction, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1985, Ser. No. 696,824
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—131 **13 Claims**



1. An oxygen-impervious pad formed on a surface of a semiconductor substrate, comprising:

a pad structure disposed on the surface of the substrate, said pad structure having an upper surface which is impervious to oxygen specie diffusion therethrough;

sidewall spacers disposed on said pad structure, said sidewall spacers being formed of a material impervious to oxygen specie diffusion therethrough; and

a thin layer of silicon oxynitride grown on said surface of said substrate and disposed below said sidewall spacers, said thin layer of silicon oxynitride preventing diffusion of oxygen specie beneath said sidewall spacers into said portion of the substrate beneath said pad structure.

4,631,220

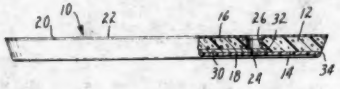
COATED ABRASIVE BACK-UP PAD WITH METAL REINFORCING PLATE

Richard B. Clifton, St. Croix, Wis., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 14, 1985, Ser. No. 734,391
Int. Cl.[4] B24D *7/16, 17/00*
U.S. Cl. 428—133 **7 Claims**

1. A coated abrasive back-up pad comprising a layer of resiliently compressible foam having first and second generally parallel spaced surfaces; a generally rigid fiber reinforced polymeric backing plate fixed to the first surface of said layer of foam; and a flexible adhesion layer fixed to the second surface of said layer of foam, said adhesion layer having a

generally planar support surface opposite said layer of foam adapted to have pressure sensitive adhesive coated abrasive sheets removably adhered thereto; said backing plate having a circular concentric array of through openings adapted to receive the shanks of screws for coupling the backing plate to a drive mechanism and said layer of foam and said adhesion layer having a corresponding array of aligned larger access openings for receiving and accessing the heads of such screws; said back-up pad further including a metal reinforcing plate around said through openings between said backing plate and said layer of foam, said reinforcing plate having through openings for receiving the shanks of the screws aligned with the through openings in said backing plate and having a periphery spaced a substantial distance inwardly from the periphery of said backing plate; and said adhesion layer being curved out of the plane of said support surface toward said backing plate around said access openings to provide radiuses at the junctures of said support surface with said access openings so that the adhesion layer will not be pulled away from the foam layer around the access openings by removal of abrasive sheets, and skins on the foam layer defining the access openings will not produce areas of higher grinding pressure along the support surface than will adjacent portions of the foam layer.



4,631,221

SHEET-LIKE SANDWICH MOLDING

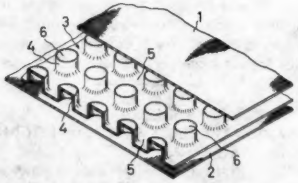
Dieter Disselbeck, Bad Soden am Taunus, and Dieter Stahl, Kriftel, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 3, 1985, Ser. No. 719,349

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1984, 3412846

Int. Cl.⁴ B32B *3/28, 3/26*

U.S. Cl. 428—166 **9 Claims**



1. A rigid sheet-like sandwich structure comprising two outer rigid covering layers connected by a core of low density and less rigid material than the covering layers, the core consisting of at least one sheet-like textile fabric of fiber material having open spaces between the fiber material, the sheet-like fabric having deformations therein formed by deep-drawing to thereby prestress the fiber material so deformed, and synthetic resin impregnating the fiber material.

4,631,222

EMBOSSING FOILS

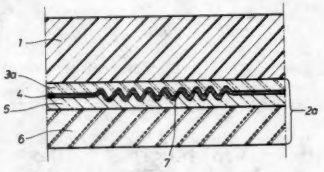
Helfried Sander, Nuremberg, Fed. Rep. of Germany, assignor to Messrs. Leonhard Kurz GmbH & Co., Fed. Rep. of Germany

Filed May 16, 1985, Ser. No. 734,795

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 3422910

Int. Cl.⁴ B32B *3/00*

U.S. Cl. 428—172 **21 Claims**



1. An embossing foil comprising a backing foil having first and second surfaces, and on said first surface of said backing foil a transfer layer means which is releasable therefrom, said transfer layer means including: a diffraction layer having first and second surfaces, and comprised of, at least in part, a protective lacquer, said diffraction layer having a portion thereof configured to provide an optical diffraction structure; and a magnetic layer having first and second surfaces and comprising a dispersion of magnetisable particles in a binding agent, said first surface of said diffraction layer being disposed towards said first surface of said backing foil, and said second surface of said diffraction layer lacquer being disposed towards said first surface of said magnetic layer.

4,631,223

EMBOSSING FOILS HAVING A MAGNETIC LAYER

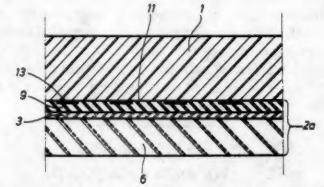
Helfried Sander, Nuremberg, Fed. Rep. of Germany, assignor to Messrs. Leonhard Kurz GmbH & Co., Fed. Rep. of Germany

Filed May 16, 1985, Ser. No. 734,793

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 3422916

Int. Cl.⁴ B32B *3/00*

U.S. Cl. 428—172 **19 Claims**



1. An embossing foil comprising a backing foil having first and second surfaces, and on said first surface a transfer layer means which is releasable therefrom, said transfer layer means including a magnetic layer having first and second sides and comprising a dispersion of magnetisable particles in a binding agent, said transfer layer means at said first side of the magnetic layer which is towards the backing foil being provided at least in a region-wise manner thereon with at least one layer of lacquer which after removal of the backing foil provides a surface which can be written upon to constitute a signing layer, wherein provided between said signing layer and said magnetic layer is a blocking layer adapted to prevent the signing layer from being attacked by solvent contained in said magnetic layer.

4,631,224

HIGH TEMPERATURE, MOLTEN METAL RESISTANT FABRIC COMPOSITION

Stephen George, and Thomas George, both of Clinton, N.J., assignors to Subtex, Inc., Hartsdale, N.Y.

Continuation-in-part of Ser. No. 688,693, Jan. 4, 1985, Pat. No. 4,591,516, and a continuation-in-part of Ser. No. 688,709, Jan. 4, 1985, Pat. No. 4,563,219, which is a division of Ser. No. 585,909, Mar. 2, 1984, Pat. No. 4,507,355. This application Aug. 12, 1985, Ser. No. 764,874

The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.

Int. Cl.[4] B32B *7/00*

U.S. Cl. 428—246 9 Claims

1. A molten metal resistant, coated fabric composition comprising:

(a) a base fabric, and

(b) a coating on the surface of the fabric comprising

(i) an inorganic binder composition colloidal silica, monoaluminum phosphate, aluminum chlorohydrate and an amount of an alkyl tin halide catalyst effective to increase the bonding of said inorganic binder composition to said fabric

(ii) an organic binder

(iii) metallic flakes having a saucer-like configuration, a particle size range of about 30 to about 150μ and a thickness of about 0.5 to about 1.5μ, the amounts of said inorganic binder composition and said organic binder being effective to bond said metallic flakes to said fabric.

4,631,225

RUBBERIZED FABRIC

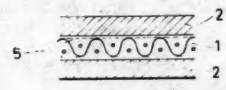
Akira Nishimura, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 28, 1985, Ser. No. 706,991

Claims priority, application Japan, Mar. 6, 1984, 59-43145

Int. Cl.[4] B05D *1/36*; B32B *25/04, 25/10*; B65D *85/84*

U.S. Cl. 428—250 10 Claims



1. An oil-proof rubberized fabric comprising (a) a woven fabric as a strength member having coated thereon (b) an adhesive resin substantially impermeable to oil applied so as to provide a uniform coating layer over said woven fabric by dip-coating, and said adhesive resin having coated thereon (c) an oil-proof synthetic rubber layer on each side substantially symmetrical relative to said woven fabric.

4,631,226

COMPOSITIONS FOR THE TREATMENT OF TEXTILE MATERIALS

Thomas Jellinek, Plenty, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Division of Ser. No. 494,290, May 13, 1983, Pat. No. 4,520,143, which is a continuation-in-part of Ser. No. 300,217, Sep. 8, 1981, abandoned, which is a continuation of Ser. No. 175,371, Aug. 5, 1980, abandoned, which is a continuation of Ser. No. 33,504, Apr. 26, 1979, abandoned. This application Mar. 19, 1985, Ser. No. 713,703

Claims priority, application Australia, May 9, 1978, PD4334

Int. Cl.[4] B05D *3/00*

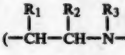
U.S. Cl. 428—270 17 Claims

1. A textile material when treated by a composition comprising an admixture of:

(a) an aqueous emulsion of a copolymer of a monomeric mixture consisting essentially of an oxirane-containing monoethylenically-unsaturated material and at least one other monethylenically-unsaturated material selected from the group characterized by the formula

wherein R is H or C_1 to C_4 alkyl and R' is a straight chain or branched chain radical of a primary or secondary alkanol, alkoxyalkanol or alkylthioalkanol having up to 14 carbon atoms, and

(b) a water soluble or water dispersible polyamine which is composed of at least 4 alkylenimine units (—CH—CH—N—) which occur in sequences of such alkylenimine units having the formula A



(A)

wherein R_1 and R_2 are independently selected from hydrogen, and lower alkyl radicals of 1 to 4 carbon atoms, R_3 is H or other alkylenimine sequences of formula A, and n is a number which has an average value of at least 2, wherein the admixture (a) and (b) is further characterized in that it exists as a stable emulsion at a pH in the range 3 to 11 and wherein the proportion of polyamine (b) is such that the sequences of alkylenimine units of formula A represent from 0.5% to 25% by weight of the non-volatile material in the combined mass of the emulsion copolymer and polyamine.

4,631,227

TOILET ARTICLE

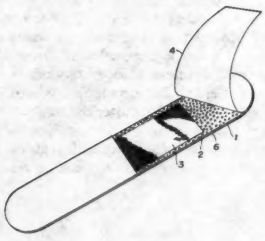
Kenji Nakamura, 3-7, Higashiyodogawa-ku, Osaka, Japan

Filed Dec. 5, 1983, Ser. No. 558,114

Claims priority, application Japan, Dec. 8, 1982, 57-213930

Int. Cl.[4] A47L *13/16, 17/00*; B32B *3/00, 5/22*

U.S. Cl. 428—283 11 Claims



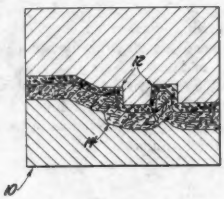
1. A cosmetic article comprising a sheet-like material, an adhesive layer formed on said sheet-like material, and a sheet consisting essentially of at least one hydrogel formable polymer selected from the group consisting of crosslinked alkali metal salts of carboxymethylcellulose and crosslinked polyalkylene oxide on said adhesive layer, said sheet of hydrogel formable polymer being present in an essentially dry condition but having the property of swelling and forming a gel when water at ambient temperature or a substance containing water is applied, said gel retaining at least 10 times its weight of water.

4,631,228

METHOD FOR MAKING A POROUS RIGID STRUCTURE AND THE POROUS RIGID STRUCTURE MADE THEREBY

Edmund R. Kruger, Sterling Heights, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Dec. 16, 1985, Ser. No. 809,021
Int. Cl.[4] B32B 5/22
U.S. Cl. 428—316.6 15 Claims



15. A porous rigid structure for use as a mold comprising; finely divided metallic particles coated with a composition of fluid thermosetting resin dissolved in a volatile solvent, carbide particles coated with said composition of fluid thermosetting resin dissolved in a volatile solvent, carbon fibers, said carbon fibers and said metallic particles and said carbide particles being mixed and compacted into a predetermined shape of particles, and characterized by a substrate structure integrally bonded to the particle layer comprising needles coated with said composition of thermosetting resin, and glass fibers, said glass fibers being mixed with said metallic needles.

4,631,229

ARTICLE HAVING A COATING PREPARED FROM RADIATION CURABLE POLY(VINYL CHLORIDE) RESIN COMPOSITION

John A. Martens, and Brian H. Williams, both of White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 501,270, Jun. 6, 1983, Pat. No. 4,559,382. This application Aug. 26, 1985, Ser. No. 769,369
Int. Cl.[4] C09U 7/02; B32B 27/32
U.S. Cl. 428—343 14 Claims

1. An article comprising a substrate bearing a coating prepared from a composition comprising a poly(vinyl chloride) resin and a vinyl chloride resin-compatible compound having (a) two to six terminal or pendant ethylenically-unsaturated groups, (b) two or more groups selected from divalent carbonylamino groups, divalent thiocarbonylamino groups, or both, and (c) polyvalent aliphatic group, Z, where Z represents the polyvalent residue remaining after the removal of hydroxyl or amino groups from an oligomeric nucleophilic compound, $Z(XH)_n$, Z containing carbon and hydrogen atoms, and having a molecular weight of 500 to 5000, where X represent —O— or

$$\begin{array}{c} R^2 \\ | \\ -N- \end{array},$$

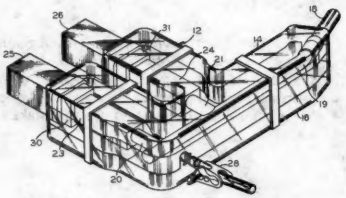
in which R^2 is hydrogen or lower alkyl group, and where n represents an integer having a value of 2 to 6, provided that there is at least one divalent carbonylamino or thiocarbonylamino group per ethylenically-unsaturated group, the amount of said vinyl chloride resin-compatible compound being sufficient so that upon exposure of the composition to actinic radiation, a gel is formed, provided that a film formed from a composition comprising poly(vinyl chloride) resin and about 10 percent by weight of said vinyl chloride resin-compatible compound remains transparent when pressed at elevated temperatures near the fusing point of the composition of poly(vinyl chloride) resin and said vinyl chloride resin-compatible compound.

4,631,230

UNIQUE EPOXY RESIN COMPOSITIONS AND COMPOSITE MOLDED BODIES FILLED THEREWITH

Kevork A. Torossian; Mark Markovitz, both of Schenectady, and Frederick E. Cox, Gloversville, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 2, 1984, Ser. No. 595,599
Int. Cl.[4] B32B 27/36
U.S. Cl. 428—412 7 Claims



1. A composite molded body of electric insulating material comprising a mold shell of thermoplastic resin selected from the group consisting of polycarbonate, polyphenylene oxide, polysulfone and polyethermide, and a cured thermosetting resin composition contained in the shell and in contact therewith and bonded thereto consisting essentially of an epoxy resin mixture of 25–75 of 1,2 epoxy resin having at least two expoxide groups per molecule and 75–25% of a polyglycol diepoxide having viscosity from 2,000–5,000 cps at 25° C. and small but effective amounts of both a phenolic accelerator and a catalytic hardener.

4,631,231

PYRETHROID-CONTAINING MOLDED ARTICLES FOR COMBATING ECTOPARASITES

Wilhelm Stendel, Wuppertal, and Herbert Voege, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 31, 1984, Ser. No. 646,551
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333657
Int. Cl.[4] B32B 27/38; B28B 3/20; G09F 3/00
U.S. Cl. 428—413 5 Claims

1. An article molded of at least one polymer selected from the group consisting of a polyvinyl resin, polyacrylate, epoxy resin, cellulose, cellulose derivative, polyamide and polyester and containing at least one pyrethroid selected from the group consisting of 3'-phenoxy-4'-fluoro-α-cyano-benzyl 2,2-dimethyl-3-(2''-p-chlorophenyl-2''-chlorovinyl)-cyclopropanecarboxylate,3'-phenoxy-4'-fluoro-α-cyano-benzyl 2,2-dimethyl-3-(2'',2''-dichlorovinyl)cyclopropane-carboxylate, pentafluorobenzyl permethrate, and isomers thereof.

4,631,232

HEAT-SENSITIVE TRANSFERRING RECORDING MEDIUM

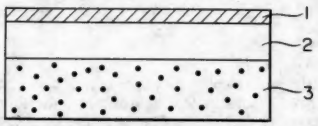
Osamu Ikawa, Yahata, and Takashi Yamahata, Yamato Koriyama, both of Japan, assignors to General Company Limited, Osaka, Japan

Filed Jul. 16, 1985, Ser. No. 755,451

Claims priority, application Japan, Jul. 18, 1984, 59-147580; Aug. 21, 1984, 59-172382

Int. Cl.[4] B32B *27/38*

U.S. Cl. 428—413 5 Claims



1. A heat-sensitive transferring recording medium which comprises a base film, a heat melting ink layer provided on the under surface of the base film, and a conveyance improving layer provided on the upper surface of the base film, said conveyance improving layer comprising a material selected from the group consisting of compounds having a perfluoroalkyl group and ultraviolet ray-curing type resins.

4,631,233

ADHESION OF LATEX COATINGS TO POLYMERIC SURFACES

Charles S. Kan, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 23, 1985, Ser. No. 812,437

Int. Cl.[4] B32B *7/10;* B05D *5/00*

U.S. Cl. 428—420 18 Claims

1. A process for adhering a latex film to a polymeric substrate comprising:

contacting a polymeric substrate comprising a cyclic imino ether group, with a latex comprising a coreactive group to form a latex film whereby covalent bonds are formed at the interface of said polymeric substrate and said latex film.

10. a product prepared by the process of claim 1.

11. A process for adhering a latex film to polymeric substrate comprising:

contacting a latex comprising a cyclic imino ether group, with a polymeric substrate comprising a coreactive group to form a latex film whereby covalent bonds are formed at the interface of said latex film and said polymeric substrate.

18. A product prepared by the process of claim 11.

4,631,234

GERMANIUM HARDENED SILICON SUBSTRATE

Graydon B. Larrabee, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 13, 1985, Ser. No. 775,885

Int. Cl.[4] H01L *21/20*

U.S. Cl. 428—428 14 Claims

1. A method of fabricating a strengthened silicon semiconductor substrate material, comprising the steps of:

adding to a silicon melt a high concentration of atoms having a size larger than the size of silicon atoms, said atoms being of the type which are substitutionally placed in the crystalline structure of said silicon substrate; and

growing said stregthened silicon semiconductor substrate material from said melt.

8. A method of growing a strengthened silicon crystal, comprising the steps:

adding polycrystalline silicon to a crucible;

adding germanium to the crucible;

heating the crucible, and thus the silicon and germanium, to form a composite melt;

dipping a monocrystalline silicon seed crystal into said melt; and

withdrawing said seed from said melt to thereby produce the strengthened silicon crystal.

10. A strengthened monocrystalline semiconductor substrate, comprising:

a silicon semiconductor material having a number of atoms of another type and of size greater than the atoms of said silicon material, said other atoms numbering more than eight thousand per million atoms of silicon and being substitutionally disposed within the silicon lattice of said material.

4,631,235

BONDING METHOD EMPLOYING COMPOSITION FOR IMPROVED ADHESION OF VINYLIDENE CHLORIDE LATEX TO IONOMER FILMS

John Biale, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 540,442, Oct. 11, 1983, Pat. No. 4,544,699.

This application Feb. 25, 1985, Ser. No. 705,351

Int. Cl.[4] B32B *27/08;* C09J *5/02*

U.S. Cl. 428—518 50 Claims

1. A method for laminating a substrate to an ionomer polyethylene carboxylate-containing film which comprises:

(a) applying as a coating to the substrate a dispersion of a vinylidene chloride copolymer in water, such vinylidene chloride copolymer comprising on a comonomer weight basis:

(1) from about 45 to about 90 percent vinylidene chloride,

(2) from about 5 to about 25 percent of a polar comonomer having one or more hydroxyl groups, and

(3) a cross-linking agent for hydroxyl groups, dissolved in said aqueous dispersion; and

(b) forcefully engaging said ionomer carboxylate-containing film with said coating at a temperature between about 130° and 250° F. so as to adhere to said coated substrate and form a laminated structure.

4,631,236

PROCESS FOR MANUFACTURING A DEVICE AND EXTRUSION BILLET FOR THIS

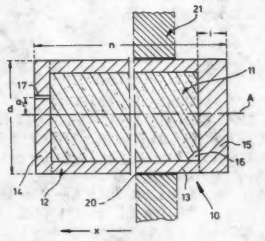
Hans-Gerd Roczyn, Hilzingen, Fed. Rep. of Germany, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Feb. 14, 1985, Ser. No. 702,001

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1984, 3406560

Int. Cl.[4] B22F *3/02;* B21C *23/22;* C22C *21/00, 21/10*

U.S. Cl. 428—558 2 Claims



1. An extrusion billet having a blank core and a mantel surrounding said core wherein said core is formed from a material comprising an aluminum alloy selected from the group consisting of high purity aluminum, AlFe, AlFeSi,

AlMn, AlMg, AlMgMn, AlZnMg, AlZnMgCu, AlCuMg and AlCuSiMn with additions of boron in a concentration of between 0.05 to 50 wt. % and said mantel is formed from a boron free aluminum alloy.

4,631,237

WIRE ELECTRODE FOR SPARK-ERODING SYSTEMS

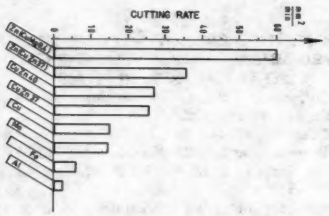
Erich Dommer, Heuchelheim, and Heinrich Groos, Herborn, both of Fed. Rep. of Germany, assignors to Berkenhoff GmbH, Heuchelheim-Kinzenbach, Fed. Rep. of Germany

Filed Apr. 17, 1985, Ser. No. 723,992

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415054

Int. Cl.⁴ B23P *1/12*

U.S. Cl. 428—621 **8 Claims**



1. In a wire electrode for spark-eroding systems for cutting of workpieces by eroding using intermittent electrical charges, including a core of a current-conducting material and a wire coating of a material having a lower evaporation temperature, the improvement which comprises: the core consists essentially of one of the following alloys:

(1) Mg 0.3–0.5% by weight
Others up to 0.3% by weight
Cu balance % by weight

(2) Fe 2.1–2.6% by weight
P 0.015–0.15% by weight
Pb up to 0.03% by weight
Zn 0.05–0.20% by weight
Others up to 0.5% by weight
Cu balance % by weight

(3) Cr 0.3–1.2% by weight
Zr 0.03–0.3% by weight
Others up to 0.2% by weight
Cu balance % by weight

(4) Zr 0.1–0.3% by weight
Others up to 0.2% by weight
Cu balance % by weight.

4,631,238

COBALT DOPED LANTHANUM CHROMITE MATERIAL SUITABLE FOR HIGH TEMPERATURE USE

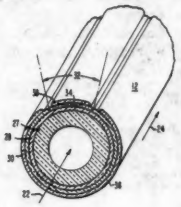
Roswell J. Ruka, Churchill, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 18, 1985, Ser. No. 692,813

Int. Cl.⁴ H01M *8/12*

U.S. Cl. 429—30 **12 Claims**

1. In a high temperature, solid electrolyte electrochemical cell, subject to thermal cycling temperatures of between about 25° C. and about 1200° C., capable of electronic interconnection to at least one other electrochemical cell and capable of operating in an environment containing oxygen, said cell having two electrodes with solid electrolyte therebetween and an electronically conductive interconnect material disposed over a portion of one electrode, the improvement comprising an interconnect comprising a cobalt doped lanthanum chromite material, where the interconnect is characterized as being



nearly impermeable to oxygen, and having a coefficient of thermal expansion that approximates the solid electrolyte in the temperature range of between about 25° C. and about 1200° C.

4,631,239

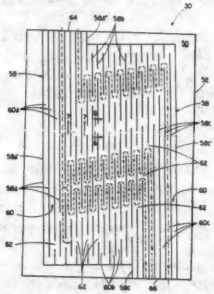
FUEL CELL PLATES WITH IMPROVED ARRANGEMENT OF PROCESS CHANNELS FOR ENHANCED PRESSURE DROP ACROSS THE PLATES

Francis R. Spurrier; Bill L. Pierce, both of Whitehall Boro, and Maynard K. Wright, Bethel Park, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 4, 1985, Ser. No. 804,414

Int. Cl.⁴ H01M *8/24*

U.S. Cl. 429—39 **20 Claims**



1. In an electrochemical fuel cell including a pair of plates with one plate having fuel gas flow defining means formed therein and the other plate having oxidant gas flow defining means formed therein, an anode electrode and a cathode electrode disposed between said plates and an electrolyte matrix sandwiched between said anode and cathode electrodes, at least one of said fuel and oxidant gas flow defining means comprising:

(a) a first group of ribs defining a first group of gas flow channels, said channels at the ame one of their opposite ends being open at a first edge of said plate and at the same other of their opposite ends being connected together in flow communication in adjacent pairs, said ribs having formed therein a first group of spaced slots which interconnect and provide flow communication between adjacent channels;

(b) a second group of ribs defining a second group of gas flow channels, said channels being connected together in flow communication in adjacent pairs at their respective opposite ends, said rib having formed therein a second group of spaced slots which interconnect and provide flow communication between adjacent channels; and

(c) a third group of ribs defining a third group of gas flow channels, said channels at the same one of their opposite ends being open at a second edge of said plate and at the

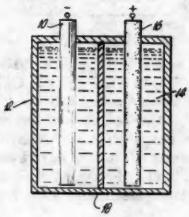
same other of their opposite ends being connected together in flow communication in adjacent pairs, said ribs having formed therein a third group of spaced slots which interconnect and provide flow communication between adjacent channels;

(d) said second group of ribs and channels being disposed between said first and third groups thereof with said slots in one of said ribs of said first and third groups thereof interconnecting and providing flow communication between respective adjacent channels in said first and second groups thereof and said second and third groups thereof.

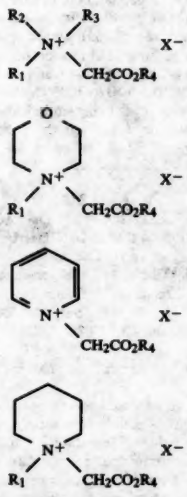
4,631,240
ELECTROCHEMICAL CELL

Fraser M. Walsh, Arlington, Mass., assignor to Tracer Technologies, Inc., Newton, Mass.

Filed Dec. 13, 1978, Ser. No. 969,227
Int. Cl.⁴ H01M *4/36*
U.S. Cl. 429—105 **3 Claims**



1. In an electrochemical cell having a metal anode wherein the metal is selected from zinc and cadmium; a bromine cathode; an aqueous electrolyte containing a metal bromide, the metal bromide having the same metal as the metal of the anode, the improvement comprising: a bromine complexing agent in said aqueous metal bromide electrolyte, said complexing agent consisting solely of a quaternary ammonium salt of an N-organo substituted alpha amino acid, ester, or betaine having one of the following formulas:

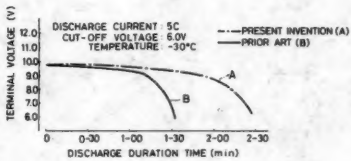


wherein $X^{\ominus}$ is a halide anion selected from the group consisting of chloride and bromide ions, R_1, R_2, and R_3 are aryl, alkyl and haloalkyl groups of from 1 to 8 carbon atoms and R_4 is hydrogen in the case of acids or alkyl and haloalkyl groups of from 1 to 8 carbon atoms in the case of esters and in the case of betaines X— represents a negative charge on the carboxyl group and R_4 is nothing which quaternary ammonium salt is soluble in water and forms a cathodically active halogen complex which is substantially water immiscible liquid at temperatures in the range of from about 10° to about 60° C.

4,631,241
RETAINER TYPE LEAD-ACID BATTERY

Yoshiharu Kawanami, Kyoto, Japan, assignor to Japan Storage Battery Company Limited, Kyoto, Japan

Filed Jul. 23, 1985, Ser. No. 758,007
Claims priority, application Japan, Jul. 23, 1984, 59-153583
Int. Cl.⁴ H01M *4/56, 4/62*
U.S. Cl. 429—225 **5 Claims**



1. A retainer type lead-acid battery having an electrolyte impregnated and retained only in a separator and positive and negative active material, wherein said separator comprises glass fibers having an average diameter of no more than 5.0 microns, said battery being fabricated such that applied pressure to an assembled element in the dry state prior to electrolyte filling is kept at a pressure of 5 to 50 kg/dm^2, and wherein said positive active material is composed of a lead oxide powder blended with anisotropic graphite in an amount of at least 0.1% of the weight of the lead oxide powder.

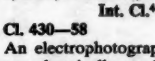
4,631,242
BISAZO ELECTROPHOTOGRAPHIC SENSITIVE MATERIALS WITH —CF_3 GROUP

Kazuhiro Emoto; Kozo Haino, and Akira Itoh, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

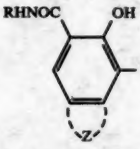
Filed Sep. 5, 1985, Ser. No. 772,878
Claims priority, application Japan, Sep. 13, 1984, 59-191992; Oct. 1, 1984, 59-206851; Oct. 2, 1984, 59-207631
Int. Cl.⁴ G03G *5/06, 5/14*
U.S. Cl. 430—58 **6 Claims**

1. An electrophotographic sensitive material which comprises an electrically conductive support and a light-sensitive layer which contains at least one of the azo compound selected from the group consisting of the following general formulas [I]–[III]:

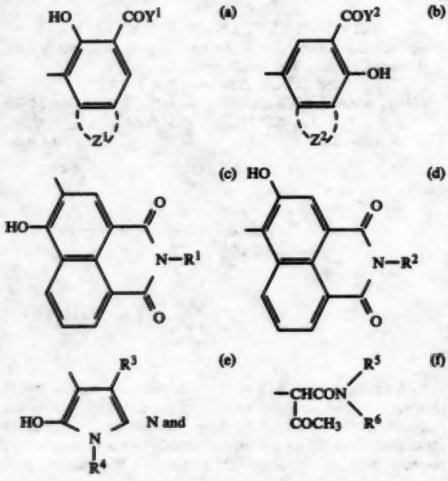
General Formula [I]:



wherein A represents a divalent residue which bonds through C atoms to N atoms which constitute azo and Cp_1 is a group represented by the formula:

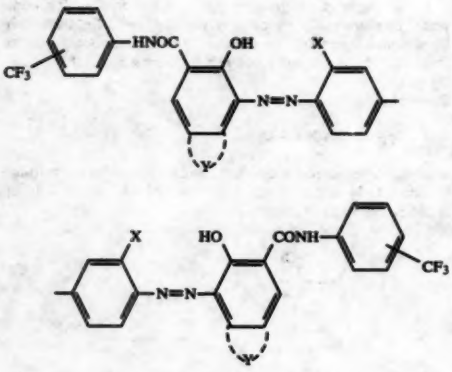


wherein Z is a group of atoms necessary to form a substituted or unsubstituted carbocyclic aromatic ring, a substituted or unsubstituted heterocyclic aromatic ring or a unsaturated monocyclic hydrocarbon ring and R represents an aryl group containing one or two CF_3 groups and Cp_2 is a coupler residue different from said Cp_1 and is selected from the group consisting of those which have the following formulas (a)–(f):



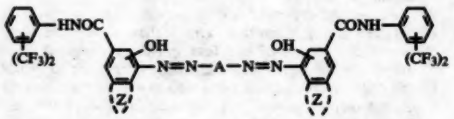
In the above formulas, Z^1 and Z^2 each is a group of atoms necessary to form a substituted or unsubstituted aromatic hydrocarbon ring or substituted or unsubstituted heterocyclic ring, R^1 and R^2 each is substituted or unsubstituted alkyl, aralkyl, aryl or heterocyclic ring group, R^3 is an alkyl or carboxyl group or an ester thereof, R^4 and R^6 is a substituted or unsubstituted aryl or heterocyclic ring group and R^5 is H, a substituted or unsubstituted alkyl, aralkyl, aryl or heterocyclic ring group and Y^1 and Y^2 each is $—NR^7R^8$, $—OR^9$, $—NHN=CH—R^{10}$ or $—NHNR^{11}R^{12}$ wherein R^7, R^8, R^9, R^{11} and R^{12} is H, substituted or unsubstituted alkyl, aralkyl, aryl or heterocyclic ring group and R^{10} is a substituted or unsubstituted aryl or heterocyclic ring group;

General formula (II):



wherein X is H, a halogen atom, a lower alkyl group, methoxy group or nitro group and Y is an aromatic ring or heterocyclic ring which may be substituted;

General formula (III):



wherein A is a divalent residue which bonds through C atoms to N atoms which constitute azo and Z is a group of atoms necessary to form a substituted or unsubstituted carbocyclic-aromatic ring, a substituted or unsubstituted heterocyclic aromatic ring or unsaturated monocyclic hydrocarbon ring.

3. An electrophotographic sensitive material according to claim 1 wherein the light-sensitive layer comprises a charge generation layer containing the azo compound and a charge transport layer containing a charge transport substance.

4,631,243

ELECTROSTATOGRAPHIC SUSPENSION DEVELOPER AND A PROCESS FOR THE PRODUCTION THEREOF

Wolfgang Podszun; John Goossens, both of Cologne; Carlhans Süling, Odenthal, all of Fed. Rep. of Germany; Herman Uytterhoeven, Bonheiden; Walter de Winter, Grafenwezen, both of Belgium; Günther Hoffarth, Leverkusen, and Wolfgang Richter, Krefeld, both of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 5, 1985, Ser. No. 752,086

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1984, 3426198

Int. Cl.⁴ G03G 9/12

U.S. Cl. 430—114 **12 Claims**

1. An electrostatographic suspension developer which contains a dispersed pigment and at least one polymer formed from basic, secondary or tertiary amino group-containing monomers, in an electrically insulating carrier liquid with a volume resistivity of at least 10^9 Ohm.cm and a dielectric constant of below 3, the improvement that the amino-groups of the polymer are completely or partially neutralised with a Bronsted acid, which contains at least one hydrocarbon radical having from 6 to 24 carbon atoms and which is a sulfonic acid, a phosphonic acid, a sulfuric acid monoester, a phosphoric acid mono- or diester or a CH-acid compound, the copolymer being added in a quantity of from 10 to 300% by weight, based on the pigment, the Bronsted acids being added in a quantity of from 0.01 to 10% by weight, based on the solids content of the suspension developer.

4,631,244

PROCESS FOR PREPARATION OF LIQUID TONERS FOR ELECTROSTATIC IMAGING USING POLAR ADDITIVE

Robert D. Mitchell, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 18, 1986, Ser. No. 830,851

Int. Cl.⁴ G03G 9/12

U.S. Cl. 430—137 **20 Claims**

1. A process for preparing toner particles for electrostatic imaging comprising

A. dispersing at an elevated temperature in a vessel a thermoplastic resin, a dispersant nonpolar liquid having a Kauri-butanol value of less than 30, and optionally a colorant, while maintaining the temperature in the vessel at a temperature sufficient to plasticize and liquify the resin and below that at which the dispersant nonpolar liquid degrades and the resin and/or colorant decomposes;

B. cooling the dispersion, either

(1) without stirring to form a gel or solid mass, followed

by shredding the gel or solid mass and grinding by means of particulate media in the presence of additional liquid;

(2) with stirring to form a viscous mixture and grinding by means of particulate media in the presence of additional liquid; or

(3) while grinding by means of particulate media to prevent the formation of a gel or solid mass in the presence of additional liquid; and

C. separating the dispersion of toner particles having an average by area particle size of less than 10 μm from the particulate media, the improvement whereby there is present, at least during the grinding in step B, 0.5 to 99% by weight of a polar additive having a Kauri-butanol value of at least 30, the percentage based on the total weight of liquid.

4,631,245

PHOTOSENSITIVE COMPOSITION ADMIXTURE OF A DIAZONIUM SALT POLYCONDENSATION PRODUCT AND POLYMERIC BINDER WITH CARBOXYL SIDE CHAIN GROUPS

Georg Pawlowski, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 4, 1985, Ser. No. 697,925

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404366

Int. Cl.⁴ G03C *1/60*

U.S. Cl. 430—175 **18 Claims**

1. A photosensitive composition, comprising: a diazonium salt polycondensation product in admixture with a non-photosensitive polymeric binder having carboxyl side groups, said diazonium salt present in an amount sufficient to render said composition insoluble upon photoexposure, said binder being soluble or at least swellable in aqueous-alkaline solutions, the binder comprising the reaction product of an intramolecular anhydride of an organic polycarboxylic acid and a synthetic polymer containing vinyl alcohol units and having no further functional groups capable of reaction with acid anhydrides the amount of said anhydride being sufficient to render said composition soluble in an aqueous-alkaline developer if said composition is not subjected to photoexposure.

4,631,246

UNIFORM COVER SHEET WITH ROUGH SURFACE IN A PHOTOSENSITIVE ELEMENT

Allyn N. Bennett, Towanda, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 642,822, Aug. 2, 1984, abandoned, which is a continuation of Ser. No. 368,126, Apr. 4, 1982, abandoned. This application Nov. 1, 1985, Ser. No. 793,759

Int. Cl.⁴ G03C *5/00*

U.S. Cl. 430—271 **20 Claims**

1. In a photosensitive element wound into laps of a roll comprising a flexible support bearing at least one layer of a photosensitive composition and a removable cover sheet protecting a surface of the photosensitive composition, wherein said photosensitive composition is positive working or is negative working and photopolymerizable or crosslinkable, said support having greater adhesion than the cover sheet to the photosensitive composition whereby the improvement comprises the cover sheet is of uniform composition, is strippable from the photosensitive composition and has a roughened finish with a peak to valley average difference of at least two microns on its surface which faces away from the photosensitive composition which allows air to be present between laps of the roll and the cover sheet has a substantially smooth surface which faces toward the photosensitive composition wherein said photosensitive composition on said flexible support is capable of lamination to a substrate after removal of said cover sheet and wherein said flexible support is capable of removal from the photosensitive composition.

4,631,247

ACETYLENE COMPOUNDS AS SHELF LIFE IMPROVERS FOR PHOTORESIST COMPOSITIONS CONTAINING ORGANIC IODIDES

Frank P. Tise, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 9, 1985, Ser. No. 764,038

Int. Cl.⁴ G03C *1/68*

U.S. Cl. 430—281 **8 Claims**

1. A photoresist composition comprising:

(a) at least one monomer capable of polymerization by photo-decomposition of an organic halide;

(b) an organic halide photoinitiator;

(c) a polymeric binder;

(d) about 0.1% to about 10%, based on the weight of the compositon, of an acetylene compound having the general formula RC≡CR′ where R and R′ are each indepedently phenyl, hydrogen, benzyl, vinyl, lower alkyl substituted vinyl, phenyl substituted vinyl, lower alkoxy methyl and phenoxymethyl; and

(e) a solvent.

4,631,248

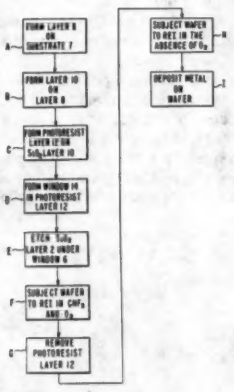
METHOD FOR FORMING AN ELECTRICAL CONTACT IN AN INTEGRATED CIRCUIT

Nicholas Pasch, Mt. View, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Jun. 21, 1985, Ser. No. 747,474

Int. Cl.⁴ B44C *1/22*

U.S. Cl. 430—313 **16 Claims**



1. A method of forming a contact through first material to material subjacent to said first material comprising the steps of:

forming a mask above said first material, said mask including a window region;

etching a first portion of said first material within said window region, a second portion of said first material remaining in said window region after said step of etching said first portion of said first material;

removing said mask; and

etching through said second portion of said first material to said subjacent layer.

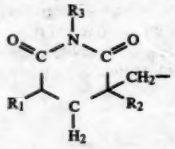
4,631,249

PROCESS FOR FORMING THERMALLY STABLE NEGATIVE IMAGES ON SURFACES UTILIZING POLYGLUTARIMIDE POLYMER IN PHOTORESIST COMPOSITION

Palaiyur S. Kalyanaraman, Chalfont, Pa., assignor to Rohm & Haas Company, Philadelphia, Pa.

Division of Ser. No. 571,053, Jan. 5, 1984, Pat. No. 4,569,897. This application Nov. 14, 1985, Ser. No. 797,731
The portion of the term of this patent subsequent to Jun. 18, 2002, has been disclaimed.
Int. Cl.[4] G03F 7/26
U.S. Cl. 430—325 6 Claims

1. A process forming an image on a surface comprising depositing a negative acting photoresist film on said surface, said film comprising a polyglutarimide polymer and a negative-acting photosensitizer dissolved in a solvent wherein said polyglutarimide polymer comprises at least about 5 wt% glutarimide units of the formula:



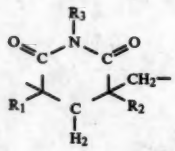
where R_1, R_2, and R_3 independently are hydrogen, unsubstituted and substituted alkyl, aryl, aralkyl or alkaryl hydrocarbons having from one to twenty carbon atoms or mixtures thereof, where at least about 20 mole percent of the R_3 substituents are hydrogen and where said negative-acting photosensitizer is selected from the group consisting of photosensitive azides and bisazides and is present in said photoresist at a sufficient quantity to enable the photoresist to become insoluble in an aqueous developer upon exposure of the photoresist to actinic radiation,

softbaking said film,

exposing a portion of said film to a source of actinic radiation that decreases the dissolution rate of said polyglutarimide in an aqueous developer, and

removing the unexposed portion of said film with said aqueous developer to form said image.

3. A process for forming an image on a surface comprising depositing a negative acting photoresist film on said surface, said film comprising a polyglutarimide polymer dissolved in a solvent wherein said polyglutarimide polymer comprises at least about 5 wt% glutarimide units of the structural formula:



where R_1, R_2, and R_3, prior to functionalization, are hydrogen, unsubstituted and substituted alkyl, aryl, aralkyl or alkaryl hydrocarbons having from one to twenty carbon atoms or mixtures thereof, and where all the R_3 hydrogen substitutents are functionalized by reacting said R_3 hydrogen substitutents with an unsaturated compound selected from the group consisting of alkenyl halides and alkenyl aromatic halides,

soft baking said film,

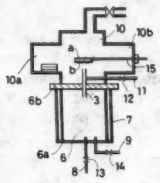
exposing a portion of said film to deep ultra violet light and removing the unexposed portion of said film with an organic developer.

4,631,250

PROCESS FOR REMOVING COVERING FILM AND APPARATUS THEREFOR

Chikara Hayashi, Chigasaki, Japan, assignor to Research Development Corporation of Japan, Tokyo, Japan

Filed Mar. 13, 1985, Ser. No. 711,475
Int. Cl.[4] G03C 11/24; B24B 1/00; B24C 1/00; B08B 7/00
U.S. Cl. 430—329 2 Claims



1. A process for removing a covering film from a surface of a substrate wherein CO_2 particles, produced in an air-tight sealed chamber, are blown from a jet nozzle by N_2 gas, said CO_2 particles being introduced into a treatment chamber against a covering film applied to the surface of the substrate.

4,631,251

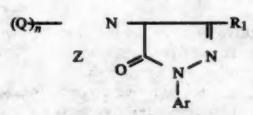
HEAT-DEVELOPABLE COLOR PHOTO-SENSITIVE MATERIAL WITH POLYMERIC COUPLER

Tawara Komamura, Hachioji; Shunji Suginaka, Tokyo, and Kimie Tachibana, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1985, Ser. No. 771,000
Claims priority, application Japan, Aug. 31, 1984, 59-182506
Int. Cl.[4] G03C 1/40, 5/54
U.S. Cl. 430—548 13 Claims

1. In a heat-developable color photo-sensitive material comprising a support bearing thereon a photographic component layer containing at least a photo-sensitive silver halide, a reducing agent, a binder and a dye-providing material; said heat-developable photo-sensitive material characterized in that at least one of said dye-providing materials is a polymer having a repetition unit being derived from a monomer represented by the Formula below:

Formula [I]



wherein, Q represents an ethylene unsaturated group or a group having an ethylene unsaturated group; Z represents a group of atoms required for forming a nitrogen-containing heterocyclic residual group in which a polymerizable ethylene unsaturated bond may also be incorporated into the heterocyclic ring, together with a nitrogen atom; R_1 represents an alkyl, aryl, alkylamino, anilino, acylamino or ureido group; Ar represents an aryl group or a heterocyclic residual group; and n is an integer of zero or one with the proviso that, when n is equal to zero, Z has an ethylene unsaturated bond in the ring of the heterocyclic residual group.

4,631,252

HYDROQUINONE ETHER COMPOUNDS

Frederick H. Howell, Atherton, England, assignor to Ciba-Geigy AG, Basel, Switzerland

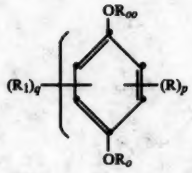
Division of Ser. No. 504,283, Jun. 14, 1983, Pat. No. 4,549,015. This application Jun. 6, 1985, Ser. No. 741,888

Claims priority, application United Kingdom, Jun. 16, 1982, 8217445; Dec. 15, 1982, 8235665

Int. Cl.[4] G03C 7/26, 7/38

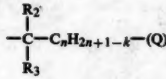
U.S. Cl. 430—551 3 Claims

1. A colour photographic silver halide material on a support which comprises at least one colour coupler—containing silver halide emulsion layer, there being present in the silver halide emulsion layer(s) or in a layer adjacent to the silver halide emulsion layer(s) a light stabilising amount of at least one compound having the formula I



(I)

wherein p is 1 or 2 and q is 0 or 1, provided that p+q is 1 or 2; R is a residue of formula II



(II)

wherein Q is selected from the residues:

(i) —COZR_4 wherein Z is —O— or —NR_5, and R_4 independently is —H, a C_1–C_{20} straight or branched chain alkyl optionally interrupted by 1 to five oxygen atoms and optionally substituted by a group—OR_6 wherein R_6 is C_3–C_{12} cycloalkyl, straight or branched C_3–C_{20} alkenyl, C_6–C_{10} aryl optionally substituted by one or two C_1–C_4 alkyl groups or C_7–C_{13} aralkyl, or R_4 is a C_2–C_{20} divalent straight or branched chain alkylene residue, a C_3–C_{20} straight or branched chain alkenyl group or a C_3–C_{12} cycloalkyl group; a C_6–C_{10} aryl group optionally substituted by one or two C_1–C_8 alkyl groups or a C_7–C_{13} aralkyl group; a 5 or 6 membered heterocycle containing an oxygen atom, and optionally substituted by one or two C_1–C_4 straight or branched chain alkyl groups; or methyl substituted by a 5 or 6 membered heterocycle containing an oxygen atom and optionally substituted by one or two C_1–C_4 straight or branched chain alkyl groups; and when Z is —NR_5, R_5 is hydrogen or a straight or branched chain C_1–C_{20} alkyl group or a C_5–C_6 cycloalkyl group, or R_4 and R_5 together with the nitrogen atom to which they are each bonded may form a 5 or 6 membered heterocyclic ring, optionally substituted by one or two C_1–C_4 alkyl groups;

(ii) —OX wherein X is R_7 or —COR_7, wherein R_7 is —H or a C_1–C_{20} straight or branched chain alkyl group, a C_3–C_{20} straight or branched chain alkenyl group, a C_3–C_{12} cycloalkyl group, a C_7–C_{13} aralkyl group, or a C_6–C_{10} aryl group, optionally substituted by one or two C_1–C_4 alkyl groups;

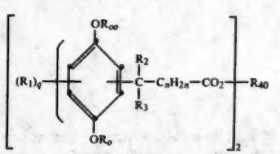
(iii) —N(R_8)(R_9) wherein R_8 and R_9 independently, are —H or a C_1–C_{20} straight or branched chain alkyl group, a C_3–C_{20} straight or branched chain alkenyl group, a C_3–C_{12} cycloalkyl group, a C_7–C_{13} aralkyl group or a C_6–C_{10} aryl group optionally substituted by one or two C_1–C_4 alkyl groups, or an acyl group of formula—COR_7 wherein R_7 has its previous significance, or R_8 and R_9, together with the nitrogen atom to which they are each bonded, form a 5- or 6-membered heterocyclic ring, optionally substituted by one or two C_1–C_4 alkyl groups;

(iv) —PO(OR_{10})([O]$_x$$R_{11}$) wherein x is 0 or 1, and when x is 1 R_{10} and R_{11} are the same or different and each is —H or a straight or branched chain C_1–C_{20} alkyl group, or a C_6–C_{10} aryl optionally substituted with one or two C_1–C_4 alkyl groups; or R_{10} and R_{11} may be linked together to form a C_2–C_3 alkylene chain optionally substituted by one to four C_1–C_{20} alkyl groups; and when x is 0, R_{10} has its previous significance and R_{11} is a C_1–C_6 straight chain alkyl group;

(v) —SO_2R_{12} wherein R_{12} is —OH, —Cl or —N(R_8)(R_7) wherein R_8 and R_7 have their previous significance; provided that, when R_{12} is —OH, then R_1 is a residue of formula II;

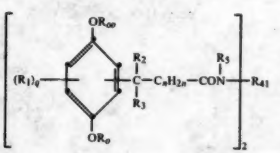
(vi) —CN, halogen or —NO_2; and

(vii) —COR_{15} wherein R_{15} is —H or a C_1–C_{20} straight or branched chain alkyl group or halogen; n is an integer from 1 to 20; k is 1 or 2; R_2 and R_3 are the same or different and each is straight or branched chain alkyl group having from 1 to 5 carbon atoms and, when Q is —CO_2R_4, either R_2 or R_3 is optionally substituted by a —CO_2R_4 group, the R_4 groups being independent, or when Q is —COOR_4 R_2 or R_3 may be so linked to the residue C_nH_{2n}——COOR_4 that there is formed a C_5–C_{12} cycloalkylene residue optionally substituted by another group —CO_2R_4 the R_4 groups being independent, wherein R_4 has its previous significance; or when Q is —COR_{15}, R_2 and R_3 may be so linked to the residue C_nH_{2n}——COR_{15} that there is formed a C_5–C_{12} cycloalkylene residue wherein R_{15} has its previous significance; provided that, when the group Q is a —CO_2R_4 residue wherein R_4 is a C_2–C_{20} divalent straight or branched chain alkylene residue then p and k are both 1 and the compound of formula I has the formula Ia:



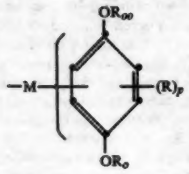
(Ia)

wherein R_{40} is a C_2–C_{20} divalent straight or branched chain alkylene residue; and provided that, when the group Q is a —CON(R_4)(R_5) residue wherein R_4 is a C_2–C_{20} divalent straight or branched chain alkylene residue and R_5 has its previous significance, then p and k are both 1 and the compound of formula I has the formula Ib:



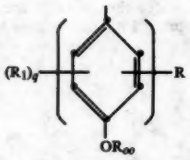
(Ib)

wherein R_2, R_3, q and n have their previous significance, R_{41} is a C_2–C_{20} divalent straight or branched chain alkyl residue; R_1 is C_1–C_8 straight or branched chain alkyl, C_5–C_7 cycloalkyl optionally substituted by one or two methyl or ethyl groups, C_7–C_9 aralkyl or a residue of formula II as hereinbefore defined, and when R_1 is a residue of formula II then R_1 and R may be the same or different; or R_1 is a residue of formula III:



(III)

in which R and p have their previous significance; and M is a direct bond; —$C(R_{13})(R_{14})$— in which R_{13} and R_{14} are the same or different and are hydrogen, C_1–C_{20} straight or branched chain alkyl optionally interrupted by 1 to 3 sulphur atoms, C_6–C_{10} aryl or R_{13} and R_{14}, together with the carbon atom to which they are attached may form a 5- or 6-membered ring which may be further substituted by one or two C_1–C_8 straight or branched chain alkyl groups; —S—; —S—S—; —SO_2—; —CH_2SCH_2—; —CH_2OCH_2— or —$C(CH_3)_2$-p-phenylen-$C(CH_3)_2$—; R_o and R_{oo} are the same or different and each is hydrogen, a C_1–C_{20} straight or branched chain alkyl group optionally interrupted by 1 to 5 oxygen atoms, a C_3–C_{12} cycloalkyl group, a C_6–C_{10} aryl group optionally substituted by one or two C_1–C_4 straight or branched chain alkyl groups, or a C_7–C_{13} aralkyl group provided that both of R_o and R_{oo} are not hydrogen, or R_{oo} has its previous significance and R_o is a residue of formula IV:

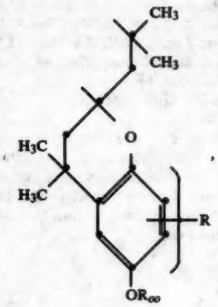


(IV)

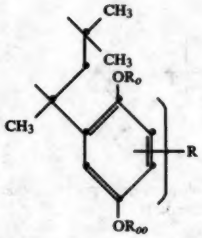
in which R, R_{oo}, R_1 and q have their previous significance, or R_o and R_1, when in ortho position to one another, together with the carbon atoms to which they are attached, may form an optionally substituted residue of formula V:

(V)

wherein A is a carbon residue containing 4 to 20 carbon atoms which forms a substituted chroman or coumaran system, or R_o and R_1 together may form a residue having the formula VI or VII:

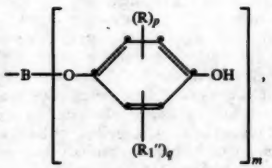


(VI)

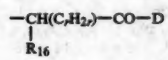


(VII)

wherein R, R_o and R_{oo} have their previous significance, provided that the compound of formula I contains only one residue of formula III or IV; or R_{oo} is hydrogen and R_o is a residue having the formula IVa or IVb:

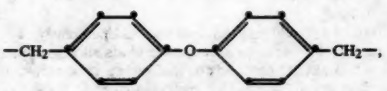


(IVa)

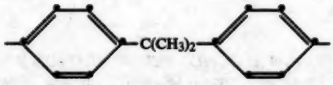


(IVb)

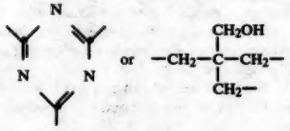
wherein p, q and R have their previous significance, R_1'' is C_1–C_8 straight or branched alkyl, C_7–C_9 aralkyl or a residue of formula II, as hereinbefore defined, m is 1 or 2, B, when m is 1, represents C_2–C_{12} alkylene which may be interrupted by 1 to 3 oxygen or sulphur atoms, C_4–C_{10} alkenylene, C_5–C_{12} cycloalkylene, C_6–C_{12} arylene, C_8–C_{12} aralkylene, $C_{4\text{-}6}$ alkynylene, xylylene, —CH_2-CH(OH)CH_2—, —$CH_2CH(OH)CH_2$—O—Y—O—CH_2-CH(OH)CH_2—,



or —CH_2COO—B′—$OCOCH_2$— wherein Y is C_2–C_{10} alkylene, C_6–C_{12} arylene,



or C_6–C_{12} cycloalkylene, B′ is C_2–C_8 alkylene, C_4–C_8 oxaalkylene, or cyclohexylene and, when m is 2, B represents a group of the formula



r is 0 to 12, R_{16} represents hydrogen or straight or branched C_1–C_{12} alkyl and D is —OR_4 or —$N(R_4)(R_5)$ wherein R_4 and R_5 have their previous significance; and with the proviso that excluded from the scope of the claim are those compounds in which p is 1, q is 1, Q is COR_{15} wherein R_{15} is H, R_o and R_{oo} are C_1–C_{20} alkyl and R_1 is C_1–C_8 alkyl, as well as salts of compounds of formula I with bases or organic or inorganic acids, respectively, when Q is an acidic or basic group.

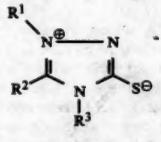
4,631,253

METHOD FOR FORMING SILVER HALIDE EMULSION COMPRISING FORMING SILVER HALIDE GRAINS IN THE PRESENCE OF MESOIONIC 1,2,4-TRIAZOLIUM-3-THIOLATE COMPOUND

Hiroyuki Mifune; Koki Nakamura, and Shoji Ishiguro, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 4, 1985, Ser. No. 697,825
Claims priority, application Japan, Feb. 3, 1984, 59-19096
Int. Cl.⁴ G03C *1/02, 1/06*
U.S. Cl. 430—569 **6 Claims**

1. A method for forming a silver halide emulsion comprising forming silver halide grains in the presence of a compound represented by formula (I), said compound being present during precipitation of said silver halide grains or thereafter until during physical ripening of said grains,



(I)

wherein $R^1$and R^2 each represents an unsubstituted or substituted alkyl group, alkenyl group, cycloalkyl group, aralkyl group, aryl group, or heterocyclic group; R^3 represents an unsubstituted or substituted alkyl group, alkenyl group, cycloalkyl group, aralkyl group, aryl group, —NR^4R^5, or a heterocyclic group, and R^4 and R^5 each represents a hydrogen atom, an alkyl group, or an aryl group; and wherein R^1 and R^2 or R^2 and R^3 can combine with each other to form a 5- or 6-membered ring.

4,631,254

CARCINOEMBRYONIC ANTIGEN DETERMINATION

Nicholas A. Giorgio, Avenel; John Krupey, Glen Rock, and Leonard T. Wilson, Verona, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 446,925, Dec. 6, 1982, abandoned. This application Sep. 6, 1985, Ser. No. 773,263
Int. Cl.⁴ G01N *33/53, 33/539, 33/541, 33/574*
U.S. Cl. 435—7 **12 Claims**

1. A method of determining the concentration of carcinoembryonic antigen in a sample of serum or plasma from a human which comprises:

(a) adding sufficient buffer to a sample of serum or plasma to produce a pH of from about 6.0 to about 6.5;
(b) adding hydrophilic silica having a BET surface area of from 100 to 400 m^2/g and an average primary particle size of from 7–16 nanometer to said sample and incubating said sample to neutralize materials in said sample which would interfere with determination of CEA;
(c) separating the silica from the sample;
(d) adding an excess of an antibody to CEA to said sample and incubating for a predetermined time;
(e) adding to said sample an amount of carcinoembryonic antigen labeled with a labeling substance capable of being quantitatively determined at least sufficient to react with the amount of antibody added in step (d) and incubating for a predetermined time;
(f) adding to said sample an insolubilizing agent thus forming a solid phase containing antibody-bound CEA and a liquid phase containing unbound CEA;
(g) separating said solid and liquid phases;
(h) determining the amount of said labeling substance present in either said solid or said liquid phase; and
(i) determining the amount of carcinoembryonic antigen present in said sample by comparison against a standard.

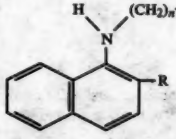
4,631,255

COMPOSITION FOR ASSAYING FOR NITRITES

Kiyoko Takino, Akishima; Hidetoshi Asahi, Kokubunji, and Hiroshi Wada, Chigasaki, all of Japan, assignors to Eiken Kagaku Kabushiki Kaisha, Japan

Filed Dec. 17, 1984, Ser. No. 682,143
Claims priority, application Japan, Jul. 23, 1984, 59-152509
Int. Cl.⁴ C12Q *1/12;* G01N *33/00*
U.S. Cl. 435—37 **14 Claims**

1. A composition for assaying for nitrites comprising a diazotizable amine, an acid component and a coupling component, wherein said coupling component comprises a compound of the following formula I:

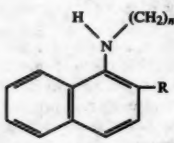


(I)

wherein R represents a hydrogen atom or a straight-chain alkyl group having 1 to 6 carbon atoms, and n represents an integer of 1 to 6, with the proviso that carbon atoms of the sulfoalkyl group may be substituted with at least 1 hydroxyl group,

or a water-soluble salt thereof.

9. A test device for assaying for nitrites, comprising a composition for assaying for nitrites supported on an absorptive carrier applied to a support, wherein said composition comprises a diazotizable amine, an acid component and a coupling component, said coupling component being a compound of the following formula I:



(I)

wherein R represents a hydrogen atom or a straight-chain alkyl group having 1 to 6 carbon atoms, and n represents an integer of 1 to 6 with the proviso that carbon atoms of the sulfoalkyl group may be substituted with at least 1 hydroxyl group,

or a water-soluble salt thereof.

4,631,256

FERMENTATION PROCESS FOR BBM-928

Hideo Koshiyama, Musashino; Fumihide Sakai, Yokohama, and Hiroaki Ohkuma, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 390,149, Jun. 21, 1982, Pat. No. 4,451,456, which is a division of Ser. No. 122,626, Mar. 6, 1980, Pat. No. 4,360,458, which is a continuation-in-part of Ser. No. 26,488, Apr. 2, 1979, abandoned. This application Oct. 6, 1983, Ser. No. 539,513

Int. Cl.[4] C12P *21/00, 1/06;* C12R *1/03*

U.S. Cl. 435—68 **3 Claims**

1. A fermentation process for production of antitumor antibiotic BBM-928 complex which comprises cultivating a strain of Actinomadura sp. having all the identifying characteristics of strain No. G455-101 in aqueous solution containing an assimilable carbon source and an assimilable nitrogen source under submerged aerobic conditions until the BBM-928 complex produced imparts substantial antitumor antibiotic activity to said solution.

4,631,257

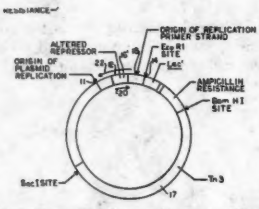
STABLE HIGH COPY NUMBER PLASMIDS

David H. Gelfand, Oakland, Calif., assignor to Cetus Corporation, Emeryville, Calif.

Continuation of Ser. No. 239,165, Feb. 27, 1981, abandoned, and a continuation-in-part of Ser. No. 972,705, Dec. 26, 1978, abandoned. This application Feb. 17, 1983, Ser. No. 467,369

Int. Cl.[4] C12P *21/00;* C12N *15/00, 1/00*

U.S. Cl. 435—68 **10 Claims**



1. A DNA plasmid comprising, a site for replication origin, a gene for formation of a replication primer strand, a site for the initiation of readthrough expression, a section of heterologous DNA downstream from said expression initiation site encoded and in proper reading frame to produce a desired protein, and an altered repressor gene leading to high copy number replication, said plasmid further having a disabling configuration for preventing readthrough transcription into said gene for the replication primer strand, said disabling configuration comprising said expression initiation site and said heterologous DNA oriented so that transcription thereof occurs oppositely to the direction of transcription of said replication primer strand gene or a stop sequence interposed between said heterologous DNA and said replication primer strand gene or both.

4,631,258

IRRADIATION ALCOHOL FERMENTATION PROCESS

Youn W. Han, New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 17, 1983, Ser. No. 524,178

Int. Cl.[4] C12P *19/14, 7/06*

U.S. Cl. 435—99 **4 Claims**

1. An alcohol fermentation process which eliminates the heat gelatinization process comprising:

(a) irradiating a starch based substrate with a sufficient amount of gamma radiation to effect sugar yield, susceptibility to enzymatic hydrolysis of starch, yeast growth, and alcohol production;

(b) treating the irradiated starch based substrate with a sufficient amount of amylases complex to effect enzymatic action;

(c) adding sufficient yeast to ferment the product of (b).

4,631,259

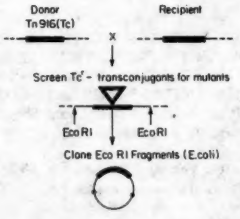
TRANSPOSON IN CLONING DNA

Don B. Clewell, and Mary C. Gawron-Burke, both of Ann Arbor, Mich., assignors to Board of Regents of The University of Michigan, Ann Arbor, Mich.

Filed May 4, 1983, Ser. No. 491,352

Int. Cl.[4] C12P *21/00;* C12N *1/00, 15/00*

U.S. Cl. 435—172.3 **8 Claims**



1. A process for cloning a gene which comprises,

(1) introducing excising transposon Tn 916 by transformation, conjugation, or transduction into a host microorganism which comprises a gene which is to be cloned,

(2) selecting for the transformed microorganisms which comprise Tn 916 inserted into said gene as evidenced by the insertional inactivation of the phenotype encoded for by said gene,

(3) isolating the DNA which contains Tn 916 from said selected transformed microorganisms,

(4) cleaving said isolated DNA with a suitable restriction enzyme so as to leave the Tn 916 and the gene intact,

(5) ligating said cleavage DNA fragment which comprises the Tn 916 and the cloned gene to a vector,

(6) introducing the chimaeric DNA produced in step (5) into a host microorganism by transformation,

(7) selecting for the transformed microorganisms which comprise said chimaeric DNA by screening for tetracycline resistance, and

(8) culturing said selected transformed microorganism in the

absence of tetracycline so as to excise Tn 916 from said chimaeric DNA and thereby restore the phenotypical trait encoded for by the cloned gene.

4,631,260

PROCESS FOR PREPARING CERAMIC MATERIALS

Donald M. Bartos, and John H. Gaul, Jr., both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 748,109, Jun. 24, 1985. This application May 23, 1986, Ser. No. 868,177
Int. Cl.[4] C04B 35/56
U.S. Cl. 501—88 30 Claims

1. A method of preparing a ceramic material, which method comprises (1) treating a preceramic silazane polymer with steam at a temperature in the range of 35° C. to 200° C. for a time sufficient to render the preceramic silazane polymer infusible wherein the treatment temperature is sufficiently low so that the preceramic silazene polymer remains unfused during the treatment step, and (2) heating the infusible preceramic silazane polymer of step (1) in an inert atmosphere, vacuum or ammonia-containing atmosphere to a temperature of at least 750° C. until said infusible preceramic silazane polymer is converted to a ceramic material.

4,631,261

METHOD FOR PREPARING HYDROCARBON CATALYTIC CRACKING CATALYST COMPOSITIONS

Goro Sato; Masamitsu Ogata, and Takanori Ida, all of Kita-Kyushu, Japan, assignors to Catalysts & Chemicals Industries Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 713,075
Claims priority, application Japan, Mar. 15, 1984, 59-49968
Int. Cl.[4] B01J 29/06
U.S. Cl. 502—65 7 Claims

1. A method for preparing a catalyst composition for cracking hydrocarbons, which comprises:

a. preparing flash-calcined alumina particles by heating alumina hydroxide, which has been prepared by the Bayer process, with hot air having a temperature of from 350° to 700° C., for 5 seconds or less,

b. mixing (i) said flash-calcined alumina particles with (ii) clay predominantly composed of silica and alumina, (iii) crystalline aluminosilicate zeolite, (iv) a precursor of siliceous inorganic oxide, and (v) water, to form an aqueous slurry,

c. spray drying said slurry to obtain fine spherical catalyst particles, said catalyst particles containing cores of said flash-calcined alumina particles covered by exterior shells of silica-alumina formed by reaction between said flash-calcined alumina and said precursor;

d. washing said catalyst particles until the alkali metal content thereof is 1.0 wt. % or less, calculated as the oxide, and

e. then substantially uniformly impregnating said catalyst particles with a rare earth component.

4,631,262

METHOD OF MAKING SEED SOLUTION USEFUL IN ZEOLITE CATALYST MANUFACTURE

Carol A. Altomare, Hillsborough Township, Somerset County, N.J., assignor to Engelhard Corporation, Menlo Park, N.J.

Filed Jun. 5, 1985, Ser. No. 741,511
Int. Cl.[4] B01J 29/08, 21/12
U.S. Cl. 502—65 10 Claims

1. The method for increasing the storage life of a clear solution of amorphous sodium aluminosilicate seeds prepared by mixing solutions of sodium silicate, sodium aluminate and sodium hydroxide, used in proportion such as to form a clear solution, heating said solution to mature the seeds in said solution, and diluting the clear seed solution by adding an effective amount of alkaline sodium silicate solution.

2. The method of claim 1 wherein the matured seed solution has a molar composition within the following range:

H_2O/Na_2O	15 to 18
Na_2O/SiO_2	.9 to 1.1
SiO_2/Al_2O_3	15.5 to 19

9. The method of claim 1 wherein said seed solution is employed to initiate the crystallization of zeolite Y in step (e) of a process for making a fluid catalytic cracking catalyst comprising the steps of:

(a) forming an aqueous slurry of finely divided hydrous kaolin clay and finely divided kaolin clay that has been calcined at least substantially through its characteristic exotherm;

(b) spray drying the aqueous slurry to obtain microspheres comprising a mixture of hydrous kaolin clay and kaolin clay that has been calcined at least substantially through its characteristic exotherm;

(c) calcining the microspheres obtained in step (b) at a temperature and for a time sufficient to convert the hydrous kaolin clay in the microspheres substantially to metakaolin and to obtain microspheres of calcined clay comprising a mixture of about 30–60% by weight metakaolin and about 40–70% by weight kaolin clay that has been calcined at least substantially through its characteristic exotherm;

(d) mixing the microspheres obtained in step (c) with the sodium silicate diluted clear seed solution prepared in claim 1 and with one or more sources of sodium silicate and water to obtain an alkaline slurry of microspheres of calcined clay in an aqueous solution containing sodium silicate, the sodium silicate used to dilute the clear seeds plus the sodium silicate added in step (d) being provided in amounts such that microspheres having a SiO_2/Al_2O_3 molar ratio of about 1.7–3.4 are obtained in step (f) below;

(e) heating the slurry of microspheres of calcined clay to a temperature and for a time sufficient to crystallize at least about 40% by weight Y-faujasite in the microspheres, said Y-faujasite being in the sodium form;

(f) separating the microspheres containing at least about 40% by weight Y-faujasite from at least a major portion of its mother liquor;

(g) and replacing sodium cations in the microspheres separated in step (f) with ammonium or rare earth cations or both.

4,631,263

WATER-REPELLENT CATALYST FOR GAS/LIQUID REACTIONS AND PROCESS FOR GAS/LIQUID REACTIONS BY USING THE SAME

Mamoru Mizumoto; Hisao Yamashita, both of Hitachi; Shinpei Matsuda, Toukai, and Kazuhiko Yamaguchi, Urayasu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 458,988, Jan. 18, 1983, abandoned. This application Oct. 15, 1985, Ser. No. 787,077
Claims priority, application Japan, Jan. 18, 1982, 57-4998
Int. Cl.[4] B01J 31/06, 35/00
U.S. Cl. 502—159 5 Claims

1. A water-repellent catalyst assembly for promoting a three-phase interface in gas/liquid reactions comprising a catalyst consisting of a carrier formed of a sheet or film consisting of a water-repellent porous polytetrofluoroethylene, said carrier having a mean pore size of 0.1 to 10 μm to provide gas permeability and liquid impermeability and a thickness of 10 to 100 μm, and a catalytically active noble metal carried directly on at least one surface of said carrier, the amount of the catalytically active noble metal being 0.1 to 10 weight % with respect to the total weight of said carrier and said catalytically active noble metal; and a hydrophilic supporting member disposed on the surface of said carrier where the catalytically active noble metal is carried, thereby facilitating contact of liquid with said catalytically active nobel metal and promoting formulation of liquid drops on the surface of the carrier.

4,631,264

CATALYST AND PROCESS FOR PREPARATION OF ALPHA, BETA-UNSATURATED ACIDS

Gary P. Hagen, Glen Ellyn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 632,018, Jul. 18, 1984, abandoned, which is a continuation of Ser. No. 412,914, Aug. 30, 1982, abandoned.
This application Oct. 7, 1985, Ser. No. 785,325
Int. Cl.[4] B01J *21/08, 27/14, 27/185, 27/182*
U.S. Cl. 502—243 10 Claims

1. A catalytic composition comprising a Group IA alkali metal component deposited on a silica component wherein said alkali metal component is present in an amount in the range of from about 200 parts per million to about 15,000 parts per million by weight and wherein said silica component is prepared by precipitating a colloidal silica from water in the presence of hydrogen ions and thereupon dried, crushed, and calcined such that the resulting silica component has a surface area of 50–500 m^2/g, a pore volume of 0.5–3.5 cc/g and an average pore diameter of 80–600 Å, and contains less than about 500 parts per million individually of aluminum, zirconium, titanium, and iron.

4,631,265

NICKEL/ALUMINA/SILICATE CATALYST, ITS PREPARATION

Johannes C. Oudejans, Delft; Peter Nootenboom, Oud-Beyerland; Keshab L. Ganguli, Bleiswijk, and Cornelis M. Lok, Rockanje, all of Netherlands, assignors to Internationale Octrooi Maatschappij "Octropa" P.B.V., Rotterdam, Netherlands

Filed Jun. 21, 1985, Ser. No. 747,439
Claims priority, application Netherlands, Jun. 21, 1984, 8401965
Int. Cl.[4] B01J *21/12, 23/74*
U.S. Cl. 502—259 14 Claims

1. A nickel/alumina/silicate catalyst, in which the atomic ratio of nickel/aluminium is between 20 and 5, the nickel/silicate molar ratio between 20 and 4.5 and the active nickel surface area is between 70 and 150 m^2/g nickel, which catalyst has an open, porous structure with macropores of 50–500 nanometers and a mesopore structure having an average pore size between 8 and 20 nanometers.

6. A process for the preparation of a nickel/alumina/silicate catalyst as defined in claim 1 wherein an insoluble nickel compound is precipitated from an aqueous solution of a nickel salt with an excess alkaline precipitating agent, which precipitate is subsequently allowed to age in suspended form and is then collected, dried and reduced, in which, after the nickel ions have been precipitated, a soluble aluminium compound and a soluble silicate added.

4,631,266

CATALYST FOR CONVERSION OF METHANOL

Johnny Wold, and Leif A. Kristiansen, both of Porsgrunn, Norway, assignors to Norsk Hydro a.s, Oslo, Norway

PCT No. PCT/NO85/00016, § 371 Date Oct. 10, 1985, § 102(e) Date Oct. 10, 1985, PCT Pub. No. WO85/04597, PCT Pub. Date Oct. 24, 1985
PCT Filed Mar. 12, 1985, Ser. No. 794,924
Claims priority, application Norway, Apr. 12, 1984, 841453
Int. Cl.[4] B01J *21/04, 23/02, 23/34, 23/72*
U.S. Cl. 502—324 4 Claims

1. A catalyst comprising aluminium oxide and copper oxide where at least 60% by weight of this oxide mixture consists of a copper-alumina spinel and 60–100% of the copper present in the catalyst is bound to aluminium oxide as copper oxide-aluminium oxide spinel, and wherein the catalyst contains an alkali or alkaline earth oxide which is present in pores of the spinel in an amount of 0.2–12% by weight calculated as metal, and wherein the catalyst contains manganese oxide in an amount corresponding to 0–10% by weight of manganese.

4,631,267

METHOD OF PRODUCING HIGH-STRENGTH HIGH SURFACE AREA CATALYST SUPPORTS

Irwin M. Lachman, and Lawrence A. Nordlie, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 18, 1985, Ser. No. 712,874
Int. Cl.[4] B01J *20/28, 29/04, 35/00*
U.S. Cl. 502—439 32 Claims

1. A method of producing a monolithic catalyst support having substantial strength and high surface area comprising:

(a) Mixing into a substantially homogeneous body

(i) a porous oxide having a surface area of at least 20 m^2/g selected from the group consisting of zeolite, silica, alumina, spinel, titania, zirconia, and mixtures of these;

(ii) a precursor of a permanent binder for the porous oxide selected from the group consisting of alumina precursors, silica precursors, titania precursors, zirconia precursors, and mixtures of these, said binder precursor having a crystallite size below 200 angstoms; and

(iii) a temporary binder; and

(b) heating the body to a temperature of from 500°–1000° C. to result in substantial strength and substantial surface area and to substantially completely burn off said temporary binder.

20. A monolithic catalyst support having a modulus of rupture of at least 500 psi, comprising 70–97 parts by weight of a high surface area porous oxide phase and 3–30 parts by weight of a permanent binder for the porous oxide phase dispersed throughout wherein

(i) the porous oxide phase has a surface area of at least 20 m^2/g and consists of alumina, silica, zeolite, spinel, zirconia, or mixtures of these; and

(ii) the binder results from heating in situ, at a temperature of 500°–1,000° C., a binder precursor consisting of alumina precursors, silica precursors, zirconia precursors, or mixtures of these, said binder precursor having a crystallite size below 200 anstroms.

4,631,268

PREPARATION OF MONOLITHIC CATALYST SUPPORT STRUCTURES HAVING AN INTEGRATED HIGH SURFACE AREA PHASE

Irwin M. Lachman; Pronob Bardhan, and Lawrence A. Nordlie, all of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 18, 1985, Ser. No. 712,875
Int. Cl.[4] B01J *20/28, 35/00*
U.S. Cl. 502—439 21 Claims

1. A method of producing a monolithic catalyst support having a first substantially continuous high-strength ceramic matrix phase and a second, discontinuous, catalyst-support phase of high surface area porous oxide embedded therein, comprising:

(a) providing multiple matrix bodies comprising a mixture of a sinterable ceramic and a plasticizing/bonding agent for the ceramic;

(b) providing multiple support bodies comprising a mixture of (i) a high surface area porous oxide having a surface area of at least 20 m^2/g selected from the group consisting of alumina, silica, spinel, titania, zirconia, zeolite, and mixtures of these, and (ii) a plasticizing/binding agent for the oxide;

(c) intermingling the matrix bodies and support bodies to form a composite thereof wherein the ratio of matrix bodies to support bodies is at least 1.3:1 and wherein the support bodies are substantially uniformly distributed through the composite;

(d) passing the composite body through a die to form a desired shape thereof; and

(e) heating the shape to sinter the ceramic material therein.

16. A monolithic catalyst support comprising a first substantially continuous ceramic matrix phase and a second, discontinuous, discrete, high surface area support phase embedded

therein wherein the matrix phase is 60–90 percent by weight of the monolith and the high surface area phase is 10–40 percent by weight of the monolith and has a surface area of at least 20 mm^2/g and comprises alumina, silica, spinel, titania, zirconia, zeolite, or mixtures of these.

17. A monolithic catalyst support of claim 16 wherein the ceramic matrix phase comprises cordierite, mullite, clay, talc, zirconia, zirconia-spinel, alumina, silica, lithium aluminosilicate, alumina-zirconia, or mixtures of these.

4,631,269

MONOLITHIC CATALYST SUPPORTS INCORPORATING A MIXTURE OF ALUMINA AND SILICA AS A HIGH SURFACE AREA CATALYST SUPPORT MATERIAL

Irwin M. Lachman, and Lawrence A. Nordlie, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 712,886, Mar. 18, 1985, abandoned, and Ser. No. 712,875, Mar. 18, 1985, abandoned. This application May 31, 1985, Ser. No. 739,627

Int. Cl.⁴ B01J *21/12, 20/28*

U.S. Cl. 502—439 **15 Claims**

1. An improved monolithic catalyst support structure comprising a structural phase of a sintered ceramic material and a high surface area support phase of a porous oxide integral with the structural phase, wherein the porous oxide support phase consists essentially of 50–93% by weight alumina and 7–50% by weight silica.

3. An improved monolithic support of claim 2 in which the monolith has a surface area of at least 15 m^2/g.

4,631,270

THERAPEUTICALLY USEFUL PSEUDOPEPTIDES, COMPOSITIONS CONTAINING THE SAME AND METHODS OF PREPARATION AND USE

John A. Yankeelov, Jr., and Kam-Fook Fok, both of Louisville, Ky., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 962,100, Nov. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 868,626, Jan. 11, 1978, abandoned. This application Mar. 25, 1985, Ser. No. 715,424

Int. Cl.⁴ A61K *37/43;* **C07K** *7/12, 7/20, 7/06*

U.S. Cl. 514—15 **13 Claims**

1. Pseudodipeptides useful in the preparation of peptide mimics of a member of the natural catalyst substrate pairs, said pseudodipeptides being selected from the group consisting of Gly Ψ Leu, Phe Ψ His, Gly Ψ Ile, Leu Ψ Leu, Ala Ψ Ala, Tyr Ψ Gly, Arg Ψ Gly, Pro Ψ Gly -NH_2, Lys Ψ Ser, and Arg Ψ Met.

4,631,271

SEROTONIN-D-FRUCTOSE AND PHARMACEUTICAL COMPOSITION CONTAINING SAME

László Mester, and Madeleine Mester nee Szadeczky-Kardoss, both of 3, Parc de Béarn, Saint-Cloud, France (92210)

Filed Jul. 19, 1976, Ser. No. 706,533

Claims priority, application France, Jul. 18, 1975, 75 22577

Int. Cl.⁴ A61K *31/70;* **C07H** *5/06*

U.S. Cl. 514—23 **3 Claims**

1. The serotonin derivative which is 1-desoxyl-1-(5-hydroxy-tryptamino) D-fructose, and its water-soluble physiologically acceptable salts.

2. A pharmaceutical composition which comprises a physiologically effective amount of the serotonin derivative of claim 1, and a physiologically acceptable carrier.

4,631,272

N-ACYLATED 1-ALKYLAMINO-1-DEOXY-KETOSE DERIVATIVES, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Oswald Lockhoff, Cologne; Bernd-Wieland Krüger, Wuppertal; Peter Stadler, Haan; Karl G. Metzger, Wuppertal; Hein-Peter Kroll, Wuppertal; Klaus Schaller, Wuppertal, and Hans-Joachim Zeller, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

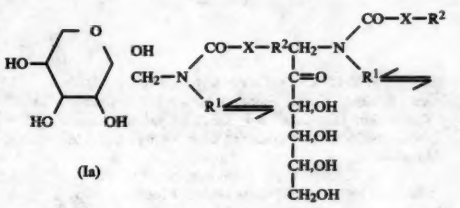
Filed Feb. 8, 1985, Ser. No. 699,712

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405841

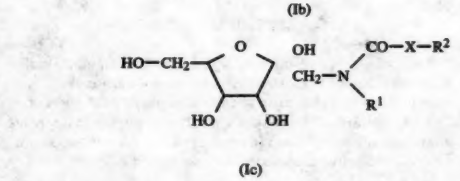
Int. Cl.⁴ A61K *31/70;* **C07H** *5/06*

U.S. Cl. 514—23 **15 Claims**

1. A compound of the formulae Ia to Ic



(Ia)



(Ib)

(Ic)

in which

R^1 represents hydrogen or a straight-chain or branched alkyl or mono or poly-unsaturated alkenyl radical with in each case up to 30 carbon atoms and optionally substituted by phenyl, halogen, amino, C_1–C_6-alkylamino, di-C_1–C_6-alkylamino, OH, C_1–C_6-alkoxy, SH, C_1–C_6-alkyl—COO and C_1–C_6-alkyl—CO—NH,

X represents CH_2, O, S or NR,

wherein

R denotes hydrogen or an alkyl group with up to 20 carbon atoms, and

R^2 represents hydrogen or a straight-chain or branched, saturated or mono- or poly-unsaturated hydrocarbon radical with up to 30 carbon atoms and optionally substituted by phenyl, halogen, amino, C_1–C_6-alkylamino, di-C_1–C_6-alkylamino, OH, C_1–C_6-alkoxy, SH, C_1–C_6-alkyl—COO and C_1–C_6-alkyl—CO—NH,

or a pharmaceutically acceptable salt thereof.

13. A method of stimulating the immune system of an animal which comprises administering to such animal an immunostimulating effective amount of a compound or salt according to claim 1.

4,631,273

AQUEOUS EMULSIONS USING CATIONIC SILANES

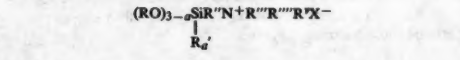
Lynne Blehm; James R. Makek, and W. Curtis White, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 5, 1984, Ser. No. 668,047

Int. Cl.⁴ A01N *63/02;* **A61K** *31/71;* **B01J** *13/00*

U.S. Cl. 514—29 **80 Claims**

1. Aqueous oil in water emulsion comprising a stable (a) water, (b) a water immiscible liquid, and (c) a cationic silane having the general formula



wherein R is an alkyl radical of 1 to 4 carbon atoms or hydrogen; a has a value of 0, 1 or 2; R' is a methyl or ethyl radical; R'' is an alkylene group of 1 to 4 carbon atoms; R''', R'''' and R^{v} are each independently selected from a group consisting of (i) saturated or unsaturated hydrocarbon radicals containing 1 to 18 carbon atoms and (ii) saturated and unsaturated organic radicals consisting of carbon, hydrogen and oxygen; carbon, hydrogen and sulfur, and carbon, hydrogen and nitrogen; the total number of carbon atoms from R''', R'''' and R^{v} in each of (i) and (ii), must be equal to or greater than twelve carbon atoms and X is selected from a group consisting of chloride, fluoride, bromide, iodide, acetate and tosylate.

4,631,274
HALOVINYL CEPHEM COMPOUNDS

Takao Takaya; Kazuo Sakane, both of Kawanishi; Hideaki Yamanaka, Hirakata, and Kenzi Miyai, Kawanishi, all of Japan, assignors to Fujisawa Pharmceutical Co., Ltd., Osaka, Japan

Filed Feb. 25, 1985, Ser. No. 704,776

Claims priority, application United Kingdom, Mar. 9, 1984, 8406231

Int. Cl.^{4} A61K *31/545*; C07D *501/24*

U.S. Cl. 514—202 **3 Claims**

1. 7-[2-carboxymethoxyimino-2-(2-aminothiazol-4-yl)acetamido]-3-[2-chlorovinyl]-3-cephem-4-carboxylic acid (syn isomer) and pharmaceutically acceptable salts thereof.

2. A method of treating an infectious disease comprising administering to a subject in need of such treatment an antimicrobially effective amount of the compound of claim 1.

4,631,275
1-OXADETHIACEPHALOSPORIN DERIVATIVES AND ANTIBACTERIAL USE THEREOF

Wolfgang Hartwig; Dieter Hübich; Karl G. Metzger, all of Wuppertal, and Hans-Joachim Zeiler, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

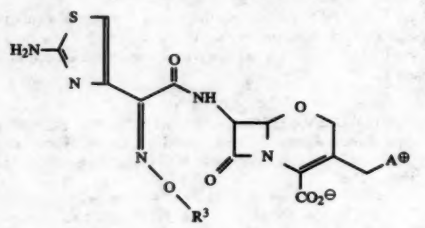
Filed Jan. 30, 1985, Ser. No. 696,275

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1984, 3404906

Int. Cl.^{4} A01N *43/90*; C07D *498/04*

U.S. Cl. 514—210 **7 Claims**

1. A 1-oxadethiacephalosporin derivative of the formula



in which

R^3 is methyl or ethyl, and

A is pyridinium or trimethylenepyridinium.

6. A method of combating bacteria which comprises administering to a patient an antibacterially effective amount of a compound according to claim 1.

4,631,276
PROSTAGLANDINS AND PROSTACYCLINS, PROCESS FOR THEIR PREPARATION AND THEIR USE AS MEDICAMENTS

Helmut Vorbrüggen; Walter Elger; Michael-Harold Town, and Ekkehard Schillinger, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

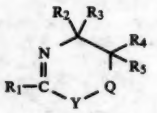
Division of Ser. No. 380,326, May 20, 1982, Pat. No. 4,468,395, which is a continuation-in-part of Ser. No. 367,869, Apr. 13, 1982, abandoned. This application Jul. 3, 1984, Ser. No. 627,572

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1981, 3115997; Nov. 13, 1981, 3145830

Int. Cl.^{4} C07D *263/14, 233/14, 277/10*; A61K *31/42*

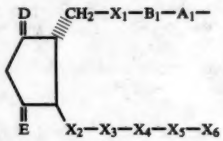
U.S. Cl. 514—211 **12 Claims**

1. A compound of the formula



wherein

(I) R_1 is a prostaglandin residue of the formula



wherein in $-X_1-B_1-A_1-$,

(a) A_1 is $-(CH_2)_n-$, $-(CH_2)_m-O-$, $-CF_2-(CH_2)_m-$, wherein n is an integer of 1–3 and m is an integer of 1–2, $-CH=CH-CH_2-$ or $-CH_2-CH=CH-$, and B_1-X_1 is $-(CH_2)_3-$ or $-CH=C=CH-$;

(b) $-X_1-B_1-A_1-$ is $-(CH_2)_5-$;

(c) B_1-A_1 is $-(CH_2)_o-$, $-(CH_2)_n-O-$, $-CF_2-(CH_2)_n-$, $-CH=CH-(CH_2)_m-$, or $-(CH_2)_m-CH=CH-$, wherein m is an integer of 1–2, n is an integer of 1–3, and o is an integer of 1–4, and X_1 is cis-alkenylene of the formula

wherein R_8 and R_9 each independently is hydrogen or C_1–C_6-alkyl; or

(d) A_1 is $-CH_2-$, B_1 is oxygen or $-CH_2-$, and X_1 is m-phenylene;

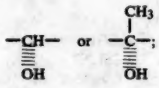
D is oxygen; hydrogen and α- or β- hydroxy; hydrogen and α- or β-(F,Cl,Br or I); or CH_2;

E is oxygen; hydrogen and α-hydroxy; hydrogen and α—CH_3; or hydrogen and α—CH_2OH;

X_2 is $-CH_2-CH_2-$, $-C\equiv C-$, or trans-alkenylene of the formula

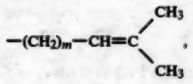
wherein R_8 and R_9 are as defined above;

X_3 is



X_4 is $-(CH_2)_n-$,
wherein n is an integer of 1–3, or

wherein R_{10} and R_{11} each independently is hydrogen, fluorine, methyl or methoxy, or R_{10} and R_{11} jointly represent $-CH_2-CH_2-$ or $-CH_2-CH_2-CH_2-$;
X_5 is $-CH_2-$, oxygen, sulfur, or a direct bond; and
X_6 is phenyl, 3- or 4-chlorophenyl, 3-trifluoromethylphenyl, α- or β-naphthyl, 2- or 3-furyl, 2- or 3-thienyl, 2-, 3-, or 4-pyridyl or, when X_5 is a direct bond, X_6 is



$-(CH_2)_m-C\equiv C-CH_3$ or $-(CH_2)_m-C\equiv C-CH_2-CH_3$, wherein m is an integer of 1–2, $-(CH_2)_4-OCH_3$, $-CH(CH_3)-CH_2-CH_2-CH_3$, $-CH_2-CH_2-CH_2-CH_3$ or $-(CH_2)_3-CH=CH_2$;
Y is oxygen, sulfur, imino, or N—(C_1–C_4-alkyl)imino;
Q is $(CR_6R_7)_p$ wherein p is an integer of 0 to 3,
R_2 is hydrogen; alkyl of 1–6 carbon atoms; alkyl of 1–6 carbon atoms substituted by hydroxy, amino, nitro, fluorine, chlorine, bromine, C_1–C_4-alkoxycarbonyl, di-C_1–C_4-alkylaminocarbonyl, C_1–C_4-alkylaminocarbonyl, tri-C_1–C_4-alkylsilyloxy, tetrahydropyranyloxy, or benzoyloxy; C_1–C_4-alkoxycarbonyl; benzyloxycarbonyl; cyano; or di-C_1–C_4-alkylaminocarbonyl;
R_3, R_4, R_5, R_6 and R_7 each independently is hydrogen; alkyl of 1–6 carbon atoms; alkyl of 1–6 carbon atoms substituted as recited for R_2; or C_{6-10}-aryl; and
R_3 and R_4 together also can form trimethylene, tetramethylene, or 1,3-butadienylene when R_2 and R_5 jointly represent an additional bond;
or a corresponding compound wherein in at least one OH group, the H atom is replaced by tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl, tribenzylsilyl or an acyl group of a C_{1-15}-hydrocarbon carboxylic or sulfonic acid.

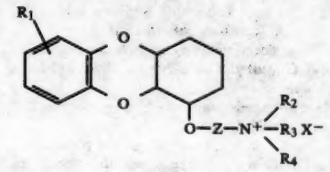
4,631,277

HEXAHYDRODIBENZODIOXANE COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS

Michel Combourieu, Aurillac; Yvon Bernet, Jussac; Jean-Claude Laigle, and Nadine Simbille, both of Aurillac, all of France, assignors to Riom Laboratories C.E.R.M. "RL-C.E.R.M." S.A., Riom, France

Filed Jul. 11, 1985, Ser. No. 753,866
Claims priority, application France, Jul. 13, 1984, 84 11174
Int. Cl.[4] A61K *31/335, 31/535;* **C07D** *319/24, 413/12*
U.S. Cl. 514—239 **10 Claims**

1. Compounds of the formula I



(I)

in which R_1 denotes H, halogen or a linear or branched C_1 to C_3 alkoxy or alkyl group, R_2, R_3 and R_4 separately denote a linear or branched C_1 to C_4 alkyl group or R_2 and R_3 together with the nitrogen atom to which they are bound form a saturated heterocyclic radical, Z denotes a linear or branched C_1 to C_6 alkylene group and X^- denotes an anion.

2. Compounds according to claim 1 in which Z denotes $-CH_2-CH_2-$.

7. Pharmaceutical composition for antispasmodic activity, characterised in that it contains at least one of the compounds according to claim 1, together with one or more usual pharmaceutical auxiliaries.

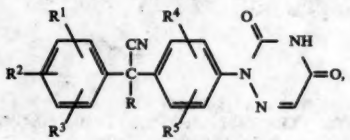
4,631,278

ANTI-PROTOZOAL α-ARYL-4-(4,5-DIHYDRO-3,5-DIOXO-1,2,4-TRIAZIN-2(3H)-YL)-BENZENEACETONITRILE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS, AND METHOD OF USE THEREFOR

Gustaaf M. Boeckx, Oud-Turnhout; Alfons H. M. Raeymaekers, Beerse, and Victor Sipido, Merksem, all of Belgium, assignors to Janssen Pharmaceutica N.V., Belgium

Continuation-in-part of Ser. No. 636,538, Aug. 1, 1984, abandoned. This application Jun. 24, 1985, Ser. No. 748,075
Int. Cl.[4] A61K *31/53;* **C07D** *253/06*
U.S. Cl. 514—242 **18 Claims**

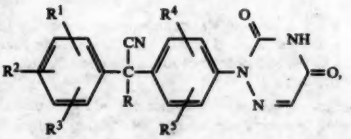
1. A chemical compound having the formula



(I)

a pharmaceutically acceptable acid addition salt or a stereochemically isomeric form thereof, wherein:
R^1, R^2 and R^3 are each independently hydrogen, halo, trifluoromethyl, C_{1-6} alkyl, C_{1-6} alkyloxy, C_{1-6} alkylthio or C_{1-6} alkylsulfonyl;
R^4 and R^5 are each independently hydrogen, halo, trifluoromethyl or C_{1-6} alkyl; and
R is hydrogen, C_{1-6} alkyl, cyclo C_{3-6} alkyl phenyl or phenyl substituted with up to three substituents each independently selected from the group consisting of halo, trifluoromethyl, C_{1-6} alkyl, C_{1-6} alkyloxy, C_{1-6} alkylthio and C_{1-6} alkylsulfonyloxy.

7. A pharmaceutical composition effective in combatting Protozoa, comprising inert carrier materials and as an active ingredient an anti-protozoal effective amount of a compound having the formula



(I)

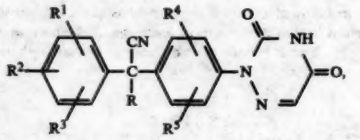
a pharmaceutically acceptable acid addition salt or a stereochemically isomeric form thereof, wherein:

R^1, R^2 and R^3 are each independently hydrogen, halo, trifluoromethyl, C_{1-6} alkyl, C_{1-6} alkyloxy, C_{1-6} alkylthio or C_{1-6} alkylsulfonyl;

R^4 and R^5 are each independently hydrogen, halo, trifluoromethyl or C_{1-6} alkyl; and

R is hydrogen, C_{1-6} alkyl, cyclo C_{3-6} alkyl phenyl or phenyl substituted with up to three substituents each independently selected from the group consisting of halo, trifluoromethyl, C_{1-6} alkyl, C_{1-6} alkyloxy, C_{1-6} alkylthio and C_{1-6} alkylsulfonyloxy.

13. A method of destroying or preventing the growth of Protozoa in subjects suffering from such Protozoa by the administration of an anti-protozoal effective amount of a compound having the formula



(I)

a pharmaceutically acceptable acid addition salt or a stereochemically isomeric form thereof, wherein:

R^1, R^2 and R^3 are each independently hydrogen, halo, trifluoromethyl, C_{1-6} alkyl, C_{1-6} alkyloxy, C_{1-6} alkylthio or C_{1-6} alkylsulfonyl;

R^4 and R^5 are each independently hydrogen, halo, trifluoromethyl or C_{1-6} alkyl; and

R is hydrogen, C_{1-6} alkyl, cyclo C_{3-6} alkyl phenyl or phenyl substituted with up to three substituents each independently selected from the group consisting of halo, trifluoromethyl, C_{1-6} alkyl, C_{1-6} alkyloxy, C_{1-6} alkylthio and C_{1-6} alkylsulfonyloxy.

4,631,279

6-(PYRIDINYLPHENYL)DIHYDROPYRIDAZINONES AS INOTROPIC AGENTS

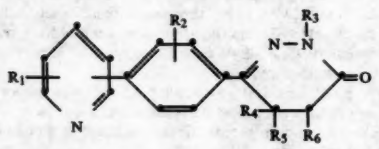
David W. Robertson, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 15, 1984, Ser. No. 660,840

Int. Cl.[4] C07D *401/10, 213/55, 211/20;* **A61K** *31/50*

U.S. Cl. 514—247 **20 Claims**

1. A compound of the formula



wherein

R_1, R_2, R_3, R_4, R_5, and R_6 are independently hydrogen or C_1–C_4 alkyl, or R_6 and one of R_4 and R_5 taken together form a bond; and pharmaceutically acceptable acid addition salts thereof.

8. A method of treating a mammal, including a human subject, suffering from or susceptible to heart failure, which comprises administering to said mammal an effective amount of a compound of claim 1.

4,631,280

PYRIDAZINE DERIVATIVES HAVING A PSYCHOTROPIC ACTION, AND MEDICAMENTS IN WHICH THEY ARE PRESENT

Jean-Paul Kan; Kathlèen Biziere, both of Clapiers, and Camille-Georges Wermuth, Strasbourg, all of France, assignors to Sanofi, Paris, France

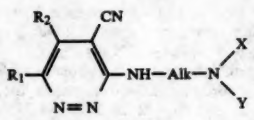
Division of Ser. No. 571,696, Jan. 18, 1984, Pat. No. 4,565,814. This application May 20, 1985, Ser. No. 735,580

Claims priority, application France, Jan. 28, 1983, 83 01366; Nov. 18, 1983, 83 18433

Int. Cl.[4] A61K *31/50;* **C07D** *237/10*

U.S. Cl. 514—247 **7 Claims**

1. A 4-cyanopyridazine corresponding to the formula:



(I)

in which:

one of the substituents R_1 and R_2 represents hydrogen or a lower alkyl group and the other represents hydrogen; a C_1–C_6 alkyl group; a C_3–C_7 cycloalkyl group; a phenyl group; a phenyl group monosubstituted by a halogen atom, a trifluoromethyl group, a hydroxyl group, a C_1–C_6 alkoxy group, a C_1–C_6 alkyl group, a C_1–C_6 alkanoyloxy group, a cyano group, a C_1–C_6 alkylthio group, a C_1–C_6 alkylsulphinyl group, a C_1–C_6 alkylsulphonyl group, a nitro group, or a sulphamyl group; a phenyl group disubstituted by one of the abovementioned substituents and at least a chlorine atom, a fluorine atom or a methoxy group; a naphth-1-yl group; a naphth-2-yl group; a thien-2-yl group; a thien-3-yl group; or an indol-3-yl group;

Alk represents an ethylene group, a 1,2-propyelene group or a 1,3-propylene group;

X represents hydrogen;

Y represents hydrogen or a β-hydroxyethyl group; and pharmaceutically acceptable salts thereof.

6. A pharmaceutical composition containing as active ingredient the compound of claim 1 present in an amount sufficient to produce psychotropic action and a pharmaceutically acceptable carrier.

4,631,281

SUBSTITUTED PHENYLPIPERAZINYL-PROPANOLS, A PROCESS FOR THEIR PREPARATION AND THEIR USE, AND FORMULATIONS CONTAINING THESE COMPOUNDS

Wolfgang Stenzel, Reinbek, and Eva Hofferber, Hamburg, both of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

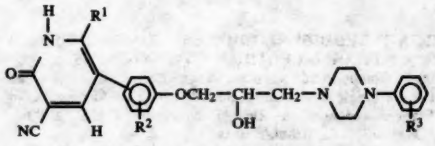
Filed Jun. 28, 1985, Ser. No. 750,729

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1984, 3424685

Int. Cl.[4] A61K *31/445;* **C07D** *401/10*

U.S. Cl. 514—252 **12 Claims**

1. Substituted phenylpiperazinyl-propanols formula I



(I)

in which R^1 denotes hydrogen or an alkyl group with 1 to 4 carbon atoms and R^2 and R^3, which can be identical or different, each denote hydrogen, halogen, cyano, a trifluoromethyl group, a nitro group, a hydroxyl group, an alkoxy group or an alkyl group with in each case 1 to 4 carbon atoms, it being

possible for the alkyl parts in each case to be straight-chain or branched, and their tautomeric forms and their salts as well as acid addition salts and N-oxides.

9. A method of combatting cardiovascular irregularity in warm-blooded animals which comprises administering to the said animal a cardiovascular effective amount of an active compound according to claim 1 either alone or in admixture with a diluent or in the form of a medicament.

4,631,282

ANTIHYPERTENSIVE CHROMANS AND CHROMENES

Frederick Cassidy, Harlow, England, assignor to Beecham Group Plc, England

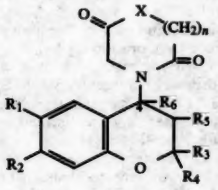
Filed Jun. 20, 1985, Ser. No. 746,968

Claims priority, application United Kingdom, Jun. 22, 1984, 8415931; Dec. 13, 1984, 8431479

Int. Cl.[4] A61K *31/495*; C07D *405/04*

U.S. Cl. 514—254 12 Claims

1. A compound of formula (I):



(I)

either one of R_1 and R_2 is hydrogen and the other is selected from the class of C_{1-6} alkylcarbonyl, C_{1-6} alkoxycarbonyl, C_{1-6} alkylcarbonyloxy, C_{1-6} alkylhydroxymethyl, nitro, cyano, chloro, trifluoromethyl, C_{1-6} alkylsulphinyl, C_{1-6} alkylsulphonyl, C_{1-6} alkoxysulphinyl, C_{1-6} alkoxysulphonyl, C_{1-6} alkylcarbonylamino, C_{1-6} alkoxycarbonylamino, C_{1-6} alkyl-thiocarbonyl, C_{1-6} alkoxy-thiocarbonyl, C_{1-6} alkyl-thiocarbonyloxy, 1-mercapto C_{2-7} alkyl, formyl, or aminosulphinyl, aminosulphonyl or aminocarbonyl, the amino moiety being optionally substituted by one or two C_{1-6} alkyl groups, or C_{1-6} alkylsulphinylamino, C_{1-6} alkylsulphonylamino, C_{1-6} alkoxysulphinylamino or C_{1-6} alkoxysulphonylamino, or ethylenyl terminally substituted by C_{1-6} alkylcarbonyl, nitro or cyano, or —C(C_{1-6} alkyl)-NOH or —C(C_{1-6} alkyl)NNH_2, or one of R_1 and R_2 is nitro, cyano or C_{1-3} alkylcarbonyl and the other is methoxy or amino optionally substituted by one or two C_{1-6} alkyl or by C_{2-7} alkanoyl;

one of R_3 and R_4 is hydrogen or C_{1-4} alkyl and the other is C_{1-4} alkyl or R_3 and R_4 together are C_{2-5} polymethylene;

either R_5 is hydrogen, hydroxy, C_{1-6} alkoxy or C_{1-7} carboxylic acyloxy and R_6 is hydrogen or R_5 and R_6 together are a bond;

n is 0 or 1; and

X is CH_2 or NR_7 wherein R_7 is hydrogen or C_{1-6} alkyl;

the nitrogen-containing group in the 4-position being trans to the R_5 group when R_5 is hydroxy, C_{1-6} alkoxy or C_{1-7} carboxylic acyloxy; or a pharmaceutically acceptable salt or solvate thereof.

12. A method of treatment of hypertension in mammals which comprises the administration to the mammal of an effective amount of a compound according to claim 1 or a pharmaceutically acceptable salt thereof.

4,631,283

ORTHO SUBSTITUTED DIHYDROXY-2(1H)QUINAZOLINONE-1-ALKANOIC ACIDS

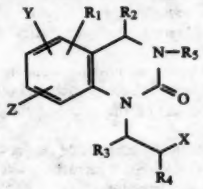
Victor T. Bandureo, Bridgewater; Seymour D. Levine, North Brunswick, both of N.J.; Dennis M. Mulvey, New Hope, and Alfonso J. Tobia, Doylestown, both of Pa., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 430,552, Sep. 30, 1982, Pat. No. 4,490,374. This application Aug. 27, 1984, Ser. No. 644,583

Int. Cl.[4] A61K *31/505*; C07D *279/80*

U.S. Cl. 514—259 18 Claims

1. A compound of the formula



wherein R_1 is hydrogen, amino and nitro; R_2 is hydrogen, alkyl having 1–20 carbon atoms, cycloalkyl wherein the cycloalkyl group has 4–8 carbon atoms, cycloalkylalkyl wherein the cycloalkyl group has 4–8 carbon atoms and the alkyl group has 1–3 carbon atoms, haloalkyl wherein the alkyl group has 1–5 carbon atoms, and norbornyl and norbornylmethyl; R_3 and R_4 are the same or different and are selected from hydrogen, lower alkyl having 1–6 carbon atoms, phenyl and substituted phenyl, wherein the substituent is alkyl having 1–6 carbon atoms, lower alkoxy having 1–4 carbon atoms, and hydroxy; R_5 may be hydrogen, lower alkyl having 1–6 carbon atoms, benzyl or substituted benzyl wherein the substituent is selected from fluoro, chloro, bromo, alkyl and alkoxy, provided that when R_5 is other than hydrogen the compound is a quaternary salt; X is benzyl, carboxy, carboalkoxy wherein the alkoxy group has 1–3 carbon atoms, cyano, carboxamido, methanesulfonyl, formyl, benzoyl, alkylbenzoyl wherein the alkyl group has 1–4 carbon atoms, pyridoyl, 2-thienoyl, 2-furoyl and 3-(1,2,5-thia-diazolyl); and pyridyl and 2-thienyl; Y and Z are hydroxy and hydrogen, provided that at least one of Y and Z is hydroxy and when Y and Z are both hydroxy the hydroxy groups are positoned at either the 5,6- or the 6,7-position; including the quaternary ammonium salts at N_3; and the alkali metal and alkaline earth metal salts of the phenols and the carboxy group at N_1 as well as the amine salts selected from meglumine, piperazine, N-methylpiperazine, morpholine and aliphatic amine salts wherein the aliphatic amine contains 1–5 carbon atoms; aminoalcohol salts selected from the ethanolamine, 2-amino-1,3-propanediol and bis(hydroxymethyl)methylamine salts; and the amino acid salts selected from the arginine, lysine and ornithine salts.

18. The method of treating a patient having hypertension and other cardiovascular disorders characterized by poor renal perfusion which comprises admininstering to said patient an effective antihypertensive amount of a compound of claim 1 in a pharmaceutically acceptable carrier.

4,631,284

ACETAMINOPHEN COMPOSITIONS CONTAINING LOW DOSES OF CHLORPHENIRAMINE MALEATE, METHOD FOR PREPARING SAME AND TABLETS FORMED THEREFROM

Anil M. Salpekar, Creve Coeur, Mo., and John Johnson, Collinsville, Ill., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Continuation of Ser. No. 672,563, Nov. 19, 1984, abandoned. This application Jul. 16, 1985, Ser. No. 755,743

Int. Cl.[4] A61K *31/16*, *31/435*, *31/135*

U.S. Cl. 514—277 24 Claims

1. A spray-dried, direct tabletting, free-flowing, particulate pharmaceutical composition having a substantially high

amount of acetaminophen and a substantially low amount of a water-soluble pheniramine maleate, and, when prepared in large quantity, being capable of being directly formed into a multiplicity of dosage-form tablets in high-speed tablet-forming operation of pharmaceutical tabletting presses, the pheniramine maleate being present in the composition in such highly uniform distribution throughout that the tablets have such tablet-to-tablet uniformity of the amount of the pheniramine maleate therein that the percent relative standard deviation of said amount is not more than about 3% as determined for a random sample of 10 tablets, the tablets being substantially free of adherence to the press and having high hardness, short disintegration time, and low friability, the composition comprising as components thereof:

(A) acetaminophen in a pharmaceutically effective major amount,

(B) a water-soluble pheniramine maleate component in a pharmaceutically effective low amount not exceeding about 5.0% based on the total weight of the acetaminophen,

(C) a pharmaceutically acceptable binder-disintegrant agent in an amount effective for imparting said hardness, disintegration time and friability,

(D) a pharmaceutically acceptable lubricant in an amount at least sufficient to impart effective mold release properties to said tablets, and

(E) water in an amount from about 0.5 to about 1.5% based on the total weight of the composition,

the composition being the product of spray drying an aqueous liquid slurry comprising an aqueous liquid medium and said components (A), (B), (C) and (D) dispersed substantially uniformly throughout said medium, the pheniramine maleate being dissolved in said medium.

4,631,285

β-CARBOLINE-3-CARBOXYLIC ACID DERIVATIVES, AND THEIR USE AS PSYCHOTROPIC AGENTS

Erling N. Petersen, Glostrup; Leif H. Jensen, Hellerup; Frank Watjen, Bajsvaerd, all of Denmark, and Dieter Seidelmann, Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

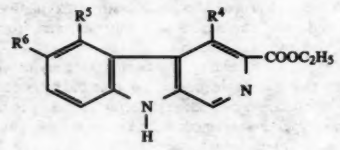
Filed May 15, 1985, Ser. No. 734,222

Claims priority, application Denmark, May 15, 1984, 2401/84

Int. Cl.[4] A61K *31/395*; C07D *471/04*

U.S. Cl. 514—292 **12 Claims**

1. A β-carboline-3-carboxylic acid ester of the formula



(I)

wherein

R^4 is methyl, ethyl or methoxymethyl,

R^5 is $—OR^8$

R^8 is C_{3-7}-cycloalkyl, C_{4-7}-alkylcycloalkyl, propinyl or cyclohexenyl,

R^9 is C_{1-4}-alkyl,

R^6 is hydrogen, $—OR^{10}$, or $—CH_2—OR^9$,

R^{10} is C_{1-4}-alkyl or C_{3-6}-cycloalkyl.

11. A method of achieving a psychotropic effect in a patient comprising administering to the patient a psychotropically effective amount of a compound of claim 1.

4,631,286

9-AMINO-1,2,3,4-TETRAHYDROACRIDIN-1-OL AND RELATED COMPOUNDS

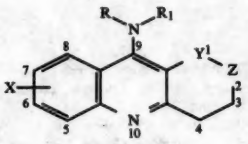
Gregory M. Shutske, and Frank A. Pierrat, both of Somerset, N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Oct. 25, 1984, Ser. No. 664,731

Int. Cl.[4] A61K *31/47*; C07D *219/10*

U.S. Cl. 514—297 **143 Claims**

1. A compund having the formula



where X is hydrogen, loweralkyl, loweralkoxy, halogen, hydroxy, nitro, $NHCOR_2$ wherein R_2 is loweralkyl, or a group of the formula NR_3R_4 wherein R_3 and R_4 are independently hydrogen or loweralkyl; R and R_1 are independently hydrogen, loweralkyl, phenylloweralkyl, phenylloweralkyl in which the phenyl group is substituted by one or more loweralkyl, loweralkoxy, halogen, hydroxy or trifluoromethyl, diphenylloweralkyl or diphenylloweralkyl in which one or both phenyl groups are substituted by one or more loweralkyl, loweralkoxy, halogen, hydroxy or trifluoromethyl; Y is C=O or CR_5OH wherein R_5 is hydrogen or loweralkyl; Z is CH_2 or $C=CR_6R_7$ wherein R_6 and R_7 are independently hydrogen or loweralkyl; an optical antipode thereof, or a pharmaceutically acceptable acid addition salt thereof.

138. A method of treating a patient in need of memory enhancement, wherein an effective memory enhancing amount of a compound defined in claim 1 is administered to the patient.

4,631,287

ARYL AND HETEROARYL ETHERS AS AGENTS FOR THE TREATMENT OF HYPERSENSITIVE AILMENTS

Utpal R. Chakraborty, Orangeburg, and Raymond D. Youssefyeh, Tarrytown, both of N.Y., assignors to USV Pharmaceutical Corp., Fort Washington, Pa.

Filed Apr. 16, 1985, Ser. No. 723,781

Int. Cl.[4] A61K *31/47*

U.S. Cl. 514—307 **55 Claims**

1. A method for the treatment of hypersensitive, inflammatory or allergic conditions in a mammal, comprising the administration of a therapeutically effective amount of a compound having the following formula:

$$(R_1)(R_2)\ Ar—Z—M—Ar_1\ (R_3)(R_4)$$

and salts thereof;

wherein

Ar and Ar_1 are independently phenyl, naphthyl or a nitrogen heterocyclic ring elected from the group consisting of quinoline and isoquinoline

Z is an alkylene chain containing from 1 to 5 carbon atoms in the principal chain and up to a total of 10 carbon atoms;

M is oxygen, sulfur or NR5,

R_1, R_2, R_3 and R_4 are each independently H, lower alkyl, lower alkoxy, hydroxy, halo, trihalomethyl, hydroxy lower alkyl, carboxy, formyl, aryl, aryloxy, benzyloxy, lower alkanoyl, carboxy lower alkoxy, nitro, amino, lower alkylamino, dilower alkylamino, cyano, lower alkanoyloxy, carbamoyl, lower alkoxy-alkoxy, or carbo-lower-alkoxy-alkoxy; and

R_5 is hydrogen or lower alkyl in a pharmaceutically acceptable carrier.

4,631,288
TRIAZOLYLMETHYL-PYRIDYLOXYMETHYL-CARBINOL FUNGICIDES

Udo Kraatz, Leverkusen; Karl H. Büchel, Burscheid; Gerd Hänssler, Leverkusen; Wilhelm Brandes, Leichlingen, and Paul Reinecke, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

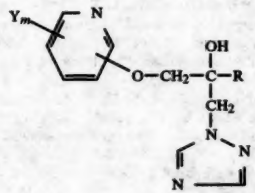
Filed Sep. 14, 1984, Ser. No. 651,002

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334409

Int. Cl.[4] C07D *401/12*; A61K *31/41*

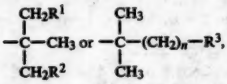
U.S. Cl. 514—340 **9 Claims**

1. A triazolylmethyl-pyridyloxymethyl-carbinol of the formula



in which

R is a radical of the formula



wherein

R^1 is hydrogen or halogen,

R^2 is halogen,

R^3 is C_1–C_4 alkoxy or C_1–C_4 alkylthio, halogenoalkoxy or halogenoalkylthio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms; alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl part; cyano; or phenoxy, phenylthio, phenylalkoxy with 1 to 4 carbon atoms in the alkyl part of phenylalkylthio with 1 to 4 carbon atoms in the alkyl part, each of which is unsubstituted or substituted on the phenyl by halogen or phenyl,

n is 0, 1 or 2,

Y is halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or cyano, and

m is 0, 1, 2, 3 or 4,

or an addition product thereof with an acid or metal salt.

4,631,289
USEFUL IN RADIOTHERAPY OF CHEMOTHERAPY 4-AZIRIDINO-1-NITROIMIDAZOL-1-YL-2,3-BUTANEDIOLS

Israr Ahmed, London; Gerald E. Adams, Epsom Downs; Ian J. Stratford, Oxted, and David Gibson, London, all of England, assignors to National Research Development Corporation, England

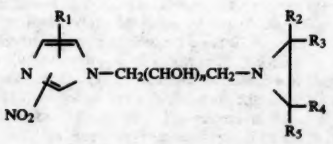
Filed May 27, 1983, Ser. No. 498,827

Claims priority, application United Kingdom, May 27, 1982, 8215545; Nov. 1, 1982, 8231107

Int. Cl.[4] A61K *31/415*; C07D *403/06*

U.S. Cl. 514—397 **13 Claims**

1. A compound of the formula:



in which formula:

R_1 represents hydrogen or alkyl;

R_2–R_5 represents hydrogen or C_1–C_6 alkyl, or unsubstituted carbocylic aryl, aralkyl or alkaryl, wherein the alkyl moiety thereof is C_1–C_6 alkyl; and

n is 2.

11. A method of treating a patient having a radiation sensitive cancer, which comprises administering a radiation sensitizing effective amount of a compound of formula I according to claim 1 to the patient prior to irradiation of the cancer.

12. A method of treating a patient having a localized or metastatic cancer, which comprises administering to the patient a chemopotentiating effective amount of a compound of formula I according to claim 1 before or simultaneously with administration of a chemotherapeutic agent.

4,631,290
METHOD OF TREATING HEPATITIS

Paul P. Hung, Bryn Mawr, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Aug. 29, 1985, Ser. No. 770,807

Int. Cl.[4] A61U *31/21, 31/26*

U.S. Cl. 514—450 **8 Claims**

1. A method of treating an animal infected by hepatitis B virus comprising administering to such infected animal an amount of a rifamycin derivative selected from a group consisting of

(a) 3-amino-4-deoxo-4-imino-rifamycin S,

(b) 3-amino-4-deoxo-4-[(4-aminophenyl)sulphonyl[amino-rifamycin SV,

(c) 4-O-(n-butylsulphonyl)-3-[(1-piperidinylimino)methyl[-rifamycin SV,

(d) 4-O-(n-butylsulfonyl)-3-[(4-morpholinylimino)methyl]-rifamycin SV, and

(e) 3-[(dimethylhydrazono)methyl]-4-O-[(3-phenylpropyl)-sulfonyl]-rifamycin SV, said amount being effective to reduce the effects of said hepatitis B virus.

4,631,291
ENTEROBACTIN TYPE COMPOUNDS

Abraham Shanzer, Rishon-Le-Zion, and Jacqueline Libman, Rehovot, both of Israel, assignors to Yeda Research & Development Co. Limited, Rehovot, Israel

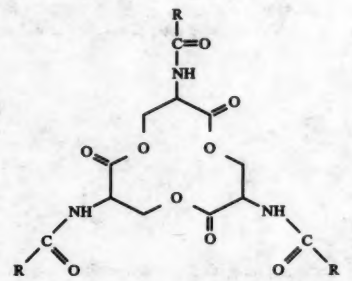
Filed Jun. 5, 1984, Ser. No. 617,465

Claims priority, application Israel, Jun. 8, 1983, 68929

Int. Cl.[4] C07D *323/00, 405/12*; A61K *31/365*

U.S. Cl. 514—450 **2 Claims**

1. An enterobactin-type compound of the formula



wherein R designates lower alkyl, fluoro-lower-alkyl, phenyl, pyridyl, hydroxyquinolyl, bipyridyl or imidazolyl.

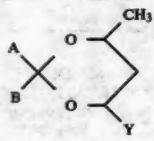
4,631,292

1,3-DIOXANE DERIVATIVES, METHOD OF THEIR SYNTHESIS AND ANTI-PEPTIC ULCER AGENT

Tsuyoshi Tomiyama, Sakaki, and Akira Tomiyama, Togura, both of Japan, assignors to Kotobuki Seiyaku Co., Ltd., Nagano, Japan

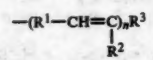
Filed Jul. 31, 1984, Ser. No. 636,143
Claims priority, application Japan, Aug. 8, 1983, 58-144709
Int. Cl.[4] C07D *319/06*
U.S. Cl. 514—452 7 Claims

1. A method of treating peptic ulcer which comprises administering to a patient suffering from peptic ulcer a therapeutic composition comprising a compound of the formula



wherein:

A is an alkyl group, an alkenyl group or a



group in which R^1 represents an alkylene group, R^2 and R^3 each represents a hydrogen atom or a lower alkyl group and n is an integer of 1 to 4,

B and Y each represents a hydrogen atom or lower alkyl group, and

A and B together may form a cyclohexyl ring optionally substituted by one or more lower alkyl groups, in an amount effective to inhibit peptic ulcer in combination with a pharmeceutically acceptable carrier.

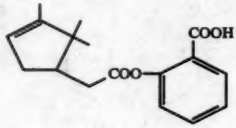
4,631,293

(−) CAMPHOLENIC ACID ESTER OF SALICYLIC ACID AND PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF HAVING MUCOSECRETOLYTIC, ANTI-INFLAMMATORY, ANALGESIC, AND ANTIPYRETIC ACTIVITY

Camillo C. Mora, Piacenza, Italy, assignor to Camillo Corvi S.p.A., Italy

Filed May 15, 1985, Ser. No. 734,067
Claims priority, application Italy, Jun. 26, 1984, 21608/84
Int. Cl.[4] C07C *69/74;* A61K *31/235*
U.S. Cl. 514—530 10 Claims

1. A (−) campholenic acid ester of salicylic acid, having the formula:



(I)

9. A method of imparting mucosecretolytic, anti-inflammatory, analgesic and antipyretic activity in a host in need thereof which comprises administering to the host an effective therapeutic amount of the compound of formula (I) of claim 1 or a pharmaceutically acceptable salt thereof.

4,631,294

TREATMENT OF CEREBRAL ISCHEMIA WITH DICHLOROACETATE

William G. Barsan, Cincinnati, Ohio, assignor to University E.M., Inc., Cincinnati, Ohio

Filed Jul. 5, 1985, Ser. No. 752,091
Int. Cl.[4] A61K *31/19*
U.S. Cl. 514—557 18 Claims

1. A method of alleviating brain damage caused by cerebral ischemia in a mammal comprising parenterally administering thereto a therapeutically effective amount of a composition containing as its active substance a pharmaceutically acceptable salt of dichloroacetic acid.

4,631,295

FUNCTIONAL OIL-CREAM BATH

Walter Engel, Pinneberg; Udo Hoppe, Hamburg, and Gerhard Sauermann, Wiemersdorf, all of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 582,370, Feb. 22, 1984, abandoned. This application May 22, 1985, Ser. No. 736,749
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1983, 3307297
Int. Cl.[4] A61K *31/20*
U.S. Cl. 514—558 18 Claims

1. In a cosmetic regenerating and normalizing oil-cream bath preparation containing pelargonic acid, an active ingredient and an inert cosmetic carrier, the improvement wherein the active ingredient contains 0.5 to 5.0% weight of pelargonic acid.

4,631,296

METHOD OF PRODUCING A SILICONE WATER-BASED ELASTOMER

Therese M. Bauman, and Alan L. Freiberg, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 830,418, Feb. 18, 1986. This application May 28, 1986, Ser. No. 867,725
Int. Cl.[4] C08J *9/30*
U.S. Cl. 521—65 6 Claims

1. A method of producing an open-cell, elastomeric foam consisting essentially of

(1) mixing in a first aerosol container under superatmospheric pressure, a composition consisting essentially of (A) 100 parts by weight of an anionically stabilized, hydroxyl endblocked polydiorganosiloxane having a weight average molecular weight of above 50,000, the organic radicals being monovalent hydrocarbon radicals containing less than seven carbon atoms per radical or 2-(perfluoroalkyl)ethyl radicals having less than seven carbon atoms per radical, present as an emulsion of dispersed particles in water, the emulsion having a pH of greater than 9; (D) from 1 to 10 parts by weight of colloidal silica, (F) optionally from 1 to 10 parts by weight of fibers having a diameter of from 1 to 10 micrometers and a length of from 30 micrometers to 10 millimeters with a length to diameter ratio of greater than 10 to 1, or from 0.2 to 1.5 parts by weight of lauryl alcohol, or mixtures thereof; and from 1 to 20 parts by weight of an aerosol propellant selected from the group consisting of isobutane, propane, dichlorodifluoromethane, trichlorofluoromethane, and mixtures thereof,

(2) mixing in a second aerosol container under superatmospheric pressure, a composition consisting essentially of (B) from 0.1 to 2.0 parts by weight of dialkyltindicarboxylate; (C) from 1 to 10 parts by weight of alkylorthosilicate of the formula $Si(OR')_4$ where R' is a lower alkyl radical of from 1 to 4 carbon atoms inclusive; (D) from 15 to 35 parts parts by weight of colloidal silica; and from 1 to 20 parts by weight of an aerosol propellant selected from the group consisting of isobutane, propane, dichlorodifluoromethane, trichlorofluoromethane, and mixtures thereof,

(3) discharging the mixture of the first and second aerosol containers into a third mixing container under superatmospheric pressure at rates which maintain the ratio of ingredients shown in (2), and mixing the contents of the third container,

(4) immediately discharging the mixture of step (3) into a space at atmospheric pressure to form a froth, then

(5) immediately removing water from the froth to form a foam.

4,631,297

ANTIMICROBIALLY EFFECTIVE ORGANIC FOAMS AND METHODS FOR THEIR PREPARATION

David R. Battice, Midland, and Michael G. Hales, Clare, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

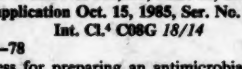
Continuation of Ser. No. 588,855, Mar. 12, 1984, abandoned. This application Oct. 15, 1985, Ser. No. 787,700

Int. Cl.[4] C08G 18/14

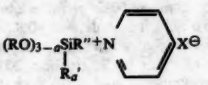
U.S. Cl. 521—78 108 Claims

1. A process for preparing an antimicrobially active nonfilled stable foam which comprises

(I) contacting and intimately mixing, prior to foaming, a foamable organic system and an organosilane having the general formula selected from the group consisting of



and



wherein, in each formula,

R is an alkyl radical of 1 to 4 carbon atoms or hydrogen;

a has a value of 0, 1 or 2;

R′ is a methyl or ethyl radical;

R″ is an alkylene group of 1 to 4 carbon atoms;

R‴, R⁗ and Rʸ are each independently selected from a group consisting of alkyl radicals of 1 to 18 carbon atoms, $-CH_2C_6H_5$, $-CH_2CH_2OH$, $-CH_2OH$, and $-(CH_2)_xNHC(O)R^{vi}$, wherein x has a value of from 2 to 10 and R^{vi} is a perfluoroalkyl radical having from 1 to 12 carbon atoms;

X is chloride, bromide, fluoride, iodide, acetate or tosylate;, and

(II) foaming the mixture from (I), and

(III) allowing the foamable organic system to stabilize, whereby an antimicrobially active stable foam is obtained.

4,631,298

MIXED DIAMINE CHAIN EXTENDER

J. Kenneth Presswood, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 16, 1985, Ser. No. 809,563

Int. Cl.[4] C08G 18/14

U.S. Cl. 521—163 32 Claims

1. A polyurethane formed by reaction of:

(a) an organic active hydrogen group-containing compound;

(b) an organic polyisocyanate; and

(c) a chain extender mixture comprising:

(i) a first aromatic diamine having a machine gel time of about 1.0 to about 4.0 seconds in a 50,000 psi modulus RIM formulation reaction: and

(ii) a second aromatic diamine having a machine gel time in a 50,000 psi modulus RIM formulation reaction of about 1.5 to 15 times the machine gel time of said first aromatic diamine;

said polyurethane having non-brittle, rigid green strength after reaction and having a flexural modulus of at least about 50,000 psi at 75° F.

4,631,299

BURN RESISTANT ORGANOPOLYSILOXANE FOAMS

Bernard Laisney, Sainte-Foy Les Lyon, and Maurice Duvernay, Saint-Genis Laval, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Feb. 10, 1986, Ser. No. 827,881

Claims priority, application France, Feb. 8, 1985, 85 01764

Int. Cl.[4] C08J 9/04

U.S. Cl. 521—77 12 Claims

1. An organopolysiloxane composition adopted for conversion into burn resistant foam, comprising (A) a diorganopolysiloxane oil blocked at each chain end by a vinyl diorganosiloxy unit, in which the organic radicals bonded to the silicon atoms are methyl, ethyl, n-propyl, vinyl, phenyl, and/or 3,3,3-trifluoropropyl radicals, and having a viscosity of 100 to 250,000 mPa·s at 25° C., (B) a diorganopolysiloxane oil blocked at each chain end by a triorganosiloxy unit, in which the organic radicals bonded to the silicon atoms are methyl, ethyl, phenyl and/or 3,3,3-trifluoropropyl radicals, and having a viscosity of 10 to 5,000 mPa·s at 25° C., (C) a diorganopolysiloxane oil blocked at each chain end by a hydroxyl radical, in which the organic radicals bonded to the silicon atoms are methyl, ethyl, phenyl and/or 3,3,3-trifluoropropyl radicals, and having a viscosity of 5 to 10,000 mPa·s at 25° C., (D) a liquid resin which comprises (i) a resin containing units of the formulae $CH_3SiO_{1.5}$ and $(CH_3)_2SiO$, in a CH_3/Si ratio of 1.1 to 1.6, having a weight content of 1 to 6% of hydroxyl radicals bonded to the silicon atoms, and having a viscosity of 1,500 to 20,000 mPa·s at 25° C., (2i) the reaction product of a solution, in an organic solvent, of a silicone resin containing units of the formulae $(CH_3)_3Si_{0.5}$ and SiO_2, the molar ratio $(CH_3)_3SiO_{0.5}/SiO_2$ of which ranges from 0.4 to 1.2, having 0.6 to 5.5 mole percent of hydroxyl radicals bonded to the silicon atoms, interracted with a diorganopolysiloxane oil blocked at each chain end by a hydroxyl radical bonded to the terminal silicon atom, in which the organic radicals bonded to the silicon atoms are methyl, ethyl, phenyl and/or 3,3,3-trifluoropropyl radicals, and having a viscosity of 10 to 4,000 mPa·s at 25° C., the weight ratio of the silicone resin to the diorganopolysiloxane oil being 0.1 to 1.0, or (3i) the mixture of the resin (i) with the reaction product (2i), the weight ratio of the resin (i) to the reaction product (2i) ranging from 0.2 to 5, (E) a liquid organohydropolysiloxane polymer containing at least three SiH groups per mole, (F) an inorganic and/or metal filler, and (G) a catalytically effective amount of a platinum catalyst.

4,631,300

PROCESS FOR PREPARING LOW VISCOSITY UV CURABLE POLYACRYLATES

Darrell D. Hicks, Jeffersontown, Ky., assignor to Interez, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 663,286, Oct. 22, 1984, which is a division of Ser. No. 488,317, Apr. 25, 1983, Pat. No. 4,511,732, which is a continuation-in-part of Ser. No. 357,960, Mar. 15, 1982, abandoned. This application Sep. 9, 1985, Ser. No. 773,978

Int. Cl.[4] C08L 63/10; C07C 67/08

U.S. Cl. 522—100 5 Claims

5. A process for preparing a liquid photopolymerizable composition which comprises:

(a) reacting at a temperature of about 60° C. to about 80° C. a C_1–C_8 aliphatic alcohol or a C_3–C_8 aliphatic ether alcohol with a diglycidyl ether of p,p′-dihydroxydiphenyl propane having an epoxide equivalent weight of about 190 to produce a diether of the diglycidyl ether wherein the diglycidyl ether is added to an excess of alcohol which contains boron trifluoride etherate in the amount of about 0.05 to about 2.0 percent by weight, based on the total reaction mixture, and wherein at least 3 equivalents of alcohol are present for each equivalent of epoxide group;

(b) removing the excess unreacted alcohol by distillation;

(c) reacting the diether of the diglycidyl ether with acrylic acid or methacrylic acid in the presence of about 0.1 to

about 3 percent by weight based on the total reaction mixture of hydroquinone monomethyl ether and about 1 to about 10 percent by weight based on the total reaction mixture of para-toluene sulfonic acid at a temperature no higher than about 120° C. while removing the water of esterification as a toluene/water azeotrope; and

(d) adding a photosensitizer.

4,631,301

METHOD FOR INCORPORATING CHLORPYRIFOS INTO THERMOPLASTIC RESINS

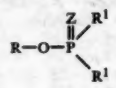
Jiro Kozuma, Fujisawa; Hirohiko Hamaguchi, Yokohama; Tetsuya Shibahara, Yamato, and Joseph P. Strasser, Tokyo, all of Japan, assignors to Dow Chemical Japan Limited, Tokyo, Japan

Filed Feb. 6, 1985, Ser. No. 698,779

Int. Cl.[4] A01N *17/10, 17/08, 25/10;* **C08K** *5/52*

U.S. Cl. 523—122 **9 Claims**

1. A method for thermally stabilizing an O-pyridyl phosphate compound of the formula



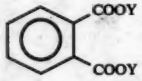
wherein

R represents halopyridyl,

Z is oxygen or sulphur, and

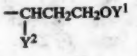
each R^1 is loweralkyoxy, amino or loweralkylamino, comprising

(a) mixing said O-pyridyl phosphate with a phthalate ester of the formula



wherein

Y is alkyl from about 2 to about 20 carbon atoms or



wherein

Y^1 is alkyl from about 1 to about 20 carbon atoms, and

Y^2 is hydrogen or methyl;

said O-pyridyl phosphate and said phthalate ester being present in proportions effective to prevent appreciable ecomposition of said O-pyridyl phosphate upon heating said mixture, and

(b) incorporating said mixture into a thermoplastic resin heated to a temperature which would decompose the O-pyridyl phosphate compound if the O-pyridyl phosphate were heated alone.

4,631,302

UNDERWATER BIOCIDAL WAX COMPOSITION AND PREPARATION THEREOF

Robert F. Supcoe, Annapolis, Md., and Thomas Radakovich, Falls Church, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 1, 1985, Ser. No. 749,975

Int. Cl.[4] A61K *31/745*

U.S. Cl. 523—122 **7 Claims**

1. A wax-based antifouling coating composition wherein said wax matrix composition comprises from about 16 to 26 weight percent of a chlorinated wax having an average number of carbon atoms from about 11 to about 13 and a chlorine content from about 65 to about 70 percent, from about 8.5 to about 11.5 weight of a chlorinated wax having an average number of carbon atoms from about 22 to about 26 and a chlorine content from about 39 to 45 percent, from about 8 to 12 weight percent of a chlorinated wax having an average number of carbon atoms from about 11 to 13 and a chlorine content from about 55 to about 65 percent, and from about 9 to about 13 weight percent of a chlorinated wax having an average number of carbon atoms from about 18 to about 22 and a chlorine content from about 36 to about 44 percent.

4,631,303

UNDERWATER FORMULATION AND METHOD FOR CLEANING AND WAXING SIMULTANEOUSLY

Robert F. Supcoe; Harold H. Singerman, and Jack E. Whitacre, all of Annapolis, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 28, 1985, Ser. No. 749,893

Int. Cl.[4] C09K *3/12*

U.S. Cl. 523—177 **7 Claims**

1. A wax formulation coating material for application to submerged surfaces consisting of a mixture, by weight percent, of about 3.5% to about 6.0% of a polyethylene homopolymer having a softening point at 85 C. (ASTM E28), a hardness of 90 (ASTM D5), a density of 0.88 g/cc (ASTM D 1505), a viscosity of 40 cps at 140 C. (Brookfield), and an acid number of nil mg./KOH gram; of about 27% to about 31% of a mixture of Chlorowaxes selected from the group consisting of chlorinated waxes with a molecular average of 12 carbon atoms and 70% chlorine content, a molecular average of 24 carbon atoms and 42% chlorine content, a molecular average of 12 carbon atoms and a chlorine content of 60%, a molecular average of 20 carbon atoms and a chlorine content of 40%, and a microcrystalline laminating wax; of about 3.5% to about 6.0% USP white mineral oil; of about 18.0% to about 20.0% 2,4,5,6-tetrachloro isophthalornitride; of about 40.5% to about 42.5% USP petrolatum; and of about 0.6% to about 1.05% Autofast Black 104 in xylene.

4,631,304

NOVEL CARBON BLACK AND PROCESS FOR PREPARING SAME

Charles R. Wilder, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 518,556, Jul. 29, 1983, Pat. No. 4,518,434. This application Mar. 18, 1985, Ser. No. 713,505

Int. Cl.[4] C08K *3/04, 9/00, 9/02;* **C09C** *1/48*

U.S. Cl. 523—215 **6 Claims**

1. A carbon black pellet which has been treated with an organic peroxide by incorporating said organic peroxide into the pelleting liquid used in forming the carbon black pellet wherein the carbon black is characterized by a surface area in the range of 20–200 m^2/g, a DBP structure in the range of 20–200 cm^3/g and a pH in the range of 5–10 and the organic peroxide is characterized by the formula R—O—O—R′ in which R and R′ can be the same or different and comprise hydrocarbyl groups containing in the range of from about 4 to about 12 carbon atoms, from about 1 to about 30 parts by weight of organic peroxide having been applied to each 100 parts by weight of carbon black and wherein the pelleting liquid comprises water.

4,631,305

POLYMERIC MATERIAL AS A DISINTEGRANT IN A COMPRESSED TABLET

Thomas L. Guyer, Richland, and Robert M. Franz, Otsego, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 22, 1985, Ser. No. 714,786

Int. Cl.[4] A61K *9/20, 47/00;* **C08L** *63/00, 25/04*

U.S. Cl. 523—400 **12 Claims**

1. A compressed tablet comprising an effective disintegrating amount of a disintegrant selected from the group consisting of:

(1) the free base or partial acid addition salt form of a cross-

linked copolymerization product of (a) a polyethylenepolyamine containing from about 2 to about 10 ethylene units and (b) a member selected from the group consisting of epichlorohydrin, glycerol-1,3-dichlorohydrin, 1,2:3,4-diepoxybutane, bis-epoxypropyl ether, ethylene glycol bis-epoxypropyl ether and 1,4-butanediol bis-epoxypropyl ether;

(2) a copolymer of polystyrene cross-linked with up to 5% w/w divinylbenzene and containing quaternary ammonium groups;

(3) a polyethylene imine polymer cross-linked with a polyfunctional halogen compound; and

(4) a polyalkyleneimine polymer prepared by cross-linking a polyalkyleneimine with linking groups containing from about 2 to 10 carbon atoms and having a molecular weight of about 20 to about 200.

4,631,306

METHOD FOR THE MANUFACTURE OF MOLDED MATERIALS

Helmut Markert; Klaus-Robert Hauschildt, both of Nuremberg; Wolfgang Rogler, and Klaus Kretzschmar, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 624,984, Jun. 27, 1984, abandoned. This application Jan. 22, 1986, Ser. No. 822,913

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1983, 3323084

Int. Cl.[4] C08L *63/00*; C08K *3/34, 3/26, 3/22*

U.S. Cl. 523—457 13 Claims

1. A method for the preparation of molded material for insulating components, which comprises:

mixing a polyepoxide, and a polyisocyanate to form a reaction resin mixture having a viscosity of up to about 7000 mPa.sec at 25° C. wherein the mole ration of epoxy to isocyanate groups is in the range of more than 1:1 to 5:1;

reacting the reaction resin mixture with a hardening catalyst selected from the group consisting of a tertiary amine and an imidazole under conditions of an elevated pressure of 1 to 10 bar, a gelling temperature of about 130° to 150° C., and a mold occupation time of between 5 and 15 minutes to form a cross-linked polymer; heating the cross-linked polymer at a temperature from about 150° to about 200° C. to cause post-hardening and produce a molded material;

said molded material having a mole ratio of oxazolidinone and isocyanurate rings greater than about 1; and the reaction of the epoxy and isocyanate groups therein being greater than 90% after hardening.

4,631,307

HEAT-RESISTANT HIGH IMPACT STYRENE RESIN, PROCESS FOR PRODUCTION THEREOF, AND RESIN COMPOSITION COMPRISING SAID STYRENE RESIN

Atsushi Hosoda; Yoshikiyo Miura, both of Chiba; Takehisa Mizuno, and Tsuyoshi Morita, both of Ichihara, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 671,871, Nov. 15, 1984, abandoned. This application Sep. 12, 1985, Ser. No. 774,872

Claims priority, application Japan, Nov. 15, 1983, 58-213312; Feb. 29, 1984, 59-38358

Int. Cl.[4] C08K *5/54*

U.S. Cl. 524—269 13 Claims

1. A moldable, thermoplastic rubber-modified styrene copolymer resin composition having heat resistance and impact strength, said composition comprising

(1) a mixture composed of (i) a rubber-modified styrene copolymer resin obtained by copolymerizing 3 to 70% by weight of a rubbery polymer and 97 to 30% by weight in total of styrene, methacrylic acid and optionally another vinyl monomer copolymerizable with styrene and methacrylic acid, the proportions of styrene, methacrylic acid and the optional other vinyl monomer being 3 to 35% by weight of methacrylic acid and correspondingly from 97 to 65% by weight in total of styrene and the optional other vinyl monomer with the proviso that when a mixture of both styrene and the other vinyl monomer is used more than 50% by weight of the mixture is styrene, said styrene, methacrylic acid and the optional other vinyl monomer being partly grafted to the rubbery polymer, and (ii) a styrene/methacrylic acid copolymer resin composed of 97 to 65% by weight of styrene or a mixture of styrene and another vinyl monomer copolymerizable with styrene and methacrylic acid with the proviso that when said mixture is used the majority of said mixture is comprised of styrene, and 3 to 35% by weight of methacrylic acid, said composition containing 1 to 50% by weight of the rubbery polymer as dispersed particles having an average particle diameter of 0.1 to 0.8 micrometer, and 3 to 35% by weight of the methacrylic acid, and

(2) 0.001 to 0.2% by weight, as silicon, of an organopolysiloxane.

4,631,308

ADHESIVE AND COATING COMPOSITION

Stephen L. Graham, Clute; David O. Plunkett, Lake Jackson, and Robert S. Lacey, Angleton, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 528,754, Sep. 1, 1983. This application May 20, 1985, Ser. No. 736,041

Int. Cl.[4] C08F *91/06*

U.S. Cl. 524—272 14 Claims

1. A hot melt adhesive and coating composition comprising: a normally solid ethylene-acrylic acid or methacrylic acid copolymer characterized as falling within the boundries defined by Points A, B, D and E of the trapezoidal figure set forth in the Drawing, wherein Points A, B, D and E represent the following characteristics of the copolymer; A, a copolymer having an acid number of about 23 and a flow rate of about 0.77; B, a copolymer having an acid number of about 93 and a flow rate of about 69; D, a copolymer having an acid number of about 8 and a flow rate of about 69; and E, a copolymer having an acid number of about 8 and a flow rate of about 0.77; a compatable wax from about 10 to about 40 percent by weight and a compatable tackifier from about 10 to about 40 percent by weight wherein the composition is characterized by limited separation for at least about 24 hours when maintained at a temperature of about 120° C. to about 232° C.

4,631,309

SHAPED ARTICLES FOR USE IN THE EXPLORATION FOR AND/OR PRODUCTION OF PETROLEUM AND NATURAL GAS

Joachim Thörmer, Leverkusen; Friedrich Leibbrandt, Kuerten; Zsolt Szentivanyi, Leverkusen, and Hartmuth Buding, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 510,286, Jul. 1, 1983, abandoned. This application Dec. 6, 1984, Ser. No. 678,720

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1982, 3226081

Int. Cl.[4] C08F *8/04*; C08K *3/26, 3/36*

U.S. Cl. 524—426 4 Claims

1. Shaped filled rubber articles for use in the exploration for and/or production of petroleum and natural gas, wherein the rubber is a crosslinked hydrogenated butadiene-acrylonitrile copolymer having an acrylonitrile content of from 24 to 55%, by weight, a residual double bond content less than 1%, with the nitrile moieties remain unhydrogenated, and wherein the filler amounts to 20 to 200 parts per hundred parts of copolymer.

4,631,310

PLATINUM (O) ALKYNE COMPLEXES AND A METHOD FOR THEIR PREPARATION

Grish Chandra, and Peter Y. Kwai Lo, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 641,903, Aug. 20, 1984, Pat. No. 4,603,215. This application Jan. 30, 1986, Ser. No. 824,041

Int. Cl.[4] C08L *83/04*

U.S. Cl. 524—862 13 Claims

1. A method for making platinum (O) alkyne complexes, said method comprising mixing an alkyne with a platinum-vinylsiloxane complex.

4,631,311

ACRYLONITRILE FREE BLENDS OF A POLYCARBONATE, A GRAFT RUBBER AND A TERPOLYMER RESIN

Frank Wingler, Leverkusen; Otto Koch; Christian Lindner, both of Cologne, and Klaus Reinking, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 8, 1985, Ser. No. 763,684

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1984, 3430689

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 1 Claim

1. A thermoplastic moulding composition consisting essentially of a blend of

(A) 12–78 parts by weight, based on the weight of the moulding composition, of a randomly structured copolymer of

(a_1) 24 to 87 parts by weight, based on the weight of the copolymer, of styrene, p-methyl styrene or mixtures thereof

(a_2) 8 to 30 parts by weight, based on the weight of the copolymer, of maleic acid anhydride and

(a_3) 5 to 68 parts by weight, based on the weight of the copolymer, of methyl methacrylate,

(B) 12–78 parts by weight, based on the weight of the moulding composition, of a thermoplastic aromatic polycarbonate and

(C) 10–40 parts by weight, based on the weight of the moulding composition, of a graft polymer of 20 to 80 parts, by weight of the graft polymer, of methacrylate on 80 to 20 parts, by weight of the graft polymer, of a rubber having a glass transition temperature below −20° C.

4,631,312

POLYMERIC COMPOSITIONS USEFUL AS BINDERS IN COATING COLORS AND COATING COLORS PREPARED THEREFROM

Jose L. Trevino, Rheinmunster, Fed. Rep. of Germany, and Bernardus J. van Rooden, Richterswil, Switzerland, assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 25, 1985, Ser. No. 715,551

Int. Cl.[4] C08L *33/02, 33/04, 33/18*

U.S. Cl. 525—221 13 Claims

1. A polymeric composition useful as the binder component in a coating color, said polymeric composition comprising at least two different polymer components a binder copolymer polymerized from unsaturated monomers, at least one of which being selected form the group consisting of monovinylidene aromatic monomers, conjugated diene monomers and α,β-ethylenically unsaturated carboxylic acid ester monomers; and a lightly cross-linked, rheology control copolymer comprising an α,β-ethylenically unsaturated carboxylic acid, an ester of an α,β-ethylenically unsaturated carboxylic acid, an unsaturated nitrile, up to 10 weight percent of a vinyl ester of a monocarboxylic acid and from 0.01 to 10 weight percent of a cross-linking monomer, said weight percent being based on the total weight of said rheology control copolymer.

4,631,313

PROCESS FOR THE POLYMERIZATION OF MIXTURES OF CIS AND TRANS-ISOMERS OF 1,3-PENTADIENE IN THE PRODUCTION OF BLOCK COPOLYMERS

Lu H. Tung, and Jerald A. Griggs, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 26, 1985, Ser. No. 749,074

Int. Cl.[4] C08F *297/04*

U.S. Cl. 525—250 7 Claims

1. In a process for preparing block copolymers from vinyl-substituted aromatic monomers and conjugated diene monomers in the absence of air and moisture, the presence of heat, a hydrocarbon solvent and an organolithium initiator, one of the conjugated diene monomers being a mixture of cis and trans-isomers of 1,3-pentadiene, the improvement comprises polymerizing the mixture of cis and trans-isomers of 1,3-pentadiene in the presence of a hydrocarbon solvent having no added aprotic solvents of a polar nature, a cis-isomer of 1,3-pentadiene polymerizing amount of a polymerization promoter, the polymerization promoter consisting essentially of a vinyl-substituted aromatic monomer added during the 1,3-pentadiene polymerization and a 1,3-pentadiene polymerization temperature of at least about 40 degrees C. but not exceeding about 60 degrees C. in the absence of added polymerization promoter or about 70 degrees C. in the presence of added polymerization promoter.

4,631,314

BLOCK COPOLYMERS UTILIZING A MIXTURE OF CIS AND TRANS-ISOMERS OF 1,3-PENTADIENE

Lu H. Tung, and Jerald A. Griggs, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 26, 1985, Ser. No. 749,080

Int. Cl.[4] C08F *297/04*

U.S. Cl. 525—314 8 Claims

1. A block copolymer prepared in a hydrocarbon solvent with an organolithium initiator of a polymerized vinyl-substituted aromatic hydrocarbon and a polymerized conjugated diene comprising:

(a) at least two blocks; and

(b) at least one block polymerized from a mixture of cis and trans-isomers of 1,3-pentadiene and a cis-isomer of 1,3-pentadiene polymerizing amount of a polymerization promoter continuously or incrementally added during the polymerization of the 1,3-pentadiene mixed isomer mixture, the polymerization promoter consisting essentially of a vinyl-substituted aromatic hydrocarbon.

5. A block copolymer wherein the block copolymer comprises a structure represented by any of the following formulae:

S-(P/S)
S-(P/S)-S
(S/P)-(P/S)-(S/P)
(S/P)-(P/S)-P-B-P-(P/S)-(S/P)
(S/P)-(P/S)-B-(P/S)-(S/P)
(S/P)-(P/S)-P-(P/S)-(S/P)
S-(P/S)-$(P/S)_1$-$(P/S)_2$
S-(P/S)-$(P/S)_1$-$(P/S)_2$-$(P/S)_3$

where S is a homopolymerized vinyl-substituted aromatic hydrocarbon, B is a conjugated diene homopolymer or copolymer, P is poly(1,3-pentadiene) polymerized from a mixture of mixed isomers of 1,3-pentadiene, S/P is a copolymer having a major amount of a polymerized vinyl-substituted aromatic hydrocarbon and a minor amount of a polymerized mixture of mixed isomers of 1,3-pentadiene, P/S is a copolymer having a major amount of a polymerized mixture of mixed isomers of 1,3-pentadiene and a minor amount of a polymerized vinyl-substituted aromatic hydrocarbon, $(P/S)_1$, $(P/S)_2$ and $(P/S)_3$ are copolymers of a polymerized mixture of mixed isomers of 1,3-pentadiene and a vinyl-substituted aromatic hydrocarbon, where the subscripts going from 1 to 3 refer to decreasing amounts of polymerized mixed isomers of 1,3-pentadiene.

4,631,315
HYDROGENATION OF NITRILE GROUP-CONTAINING UNSATURATED POLYMERS

Hartmuth Buding, Dormagen; Paul Fiedler, Cologne; Heinrich Königshofen, Bergisch-Gladbach, and Joachim Thörmer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 3, 1985, Ser. No. 771,646

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1984, 3433392

Int. Cl.[4] C08F *8/04*

U.S. Cl. 525—338 **5 Claims**

1. In a process for the hydrogenation of at least 80% of olefinic bonds contained in an unsaturated copolymer derived from:

85 to 50%, by weight, conjugated diene,

15 to 50%, by weight, unsaturated nitrile,

0 to 10%, by weight, of a monomer copolymerizable with the conjugated diene and the unsaturated nitrile,

with preservation of the nitrile groups, the improvement comprising, hydrogenating in the presence of a low molecular weight ketone solvent with a catalyst of the formula

$$RuX[(L_1)(L_2)_n]$$

wherein X is hydrogen or halogen,

L_1 is hydrogen, halogen, cyclopentadienyl, or methyl, ethyl or phenyl substituted cyclopentadienyl,

L_2 is a phosphane, bisphosphane or arsane,

n is 1, 2 or 3,

or $[(L_1)(L_2)_n]$ is a cyclopentadienyl-bisphosphane,

where the concentration of the catalyst, calculated as Ruthenium and based on the unsaturated polymer, is from 10 to 1000 ppm and the concentration of the unsaturated copolymer, based on the total solution, is from 1 to 99% by weight.

4,631,316
CURABLE RUBBER COMPOSITIONS COMPRISING SUBSTITUTED DITHIOCARBAMYLUREA ACCELERATORS

Joseph F. Stieber, Prospect, Conn., assignor to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed Mar. 1, 1984, Ser. No. 585,072

Int. Cl.[4] C08C *19/20*

U.S. Cl. 525—352 **1 Claim**

1. A curable rubber composition comprising:

(a) an accelerator compound of the formula

$$R^1—NHC(O)NHSC(S)NR^2R^3$$

wherein R^1 is phenyl; and R^2 and R^3 are methyl; and

(b) at least one member of the group consisting of uncured natural rubber, cis-polyisoprene, trans-polyisoprene, polybutadiene, styrene-butadiene copolymer, acrylonitrile-butadiene copolymer and ethylene-propylene-nonconjugated diene terpolymer.

4,631,317
PRODUCTION OF SULPHONIC ACID GROUP-CONTAINING ACRYLONITRILE POLYMERS AND MONOMERS THEREFOR

Joachim König, Odenthal, and Siegfried Korte, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 19, 1984, Ser. No. 672,551

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342694

Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—383 **17 Claims**

1. A process for the production of sulphonic acid- and sulphonate group-containing acrylonitrile copolymers comprising copolymerization of 75 to 99.95% by weight of acrylonitrile, up to 24.95% by weight of further copolymerizable monomers free from ionic or sulphonic acid ester groups, and 0.05 to 8% by weight of a third component, the weight percentages relating to the total quantity of the monomers, in aliphatic hydrocarbons or in mixtures of aliphatic hydrocarbons using a redox catalyst comprising SO_2 and an organic hydroperoxide, the third component being an ethylenically unsaturated sulphonic acid ester free from carboxylic acid and carboxylic acid ester groups, the sulphonic acid ester groups of the copolymer are saponified before, during or after shaping.

4,631,318
POLYMERIC MOLECULAR COMPOSITES

Wen-Fang Hwang; Donald R. Wiff, both of Beavercreek, and Thaddeus E. Helminiak, Oakwood, all of Ohio, assignors to Research Corporation, New York, N.Y.

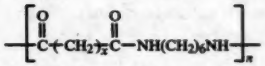
Filed Mar. 8, 1983, Ser. No. 473,214

Int. Cl.[4] C08L *77/00*

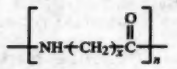
U.S. Cl. 525—432 **19 Claims**

1. A polymeric molecular composite comprising, based on the total weight of said composite, a mixture of about 30 to 60 weight percent of an aromatic heterocyclic rigid rod polymer dispersed in about 70 to 40 weight percent of a continuous flexible coil-like thermoplastic polymer matrix,

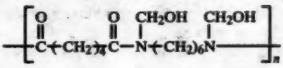
said coil-like thermoplastic polymer being a polyamide having a structural formula selected from the group consisting of



wherein x is 4 or 8,

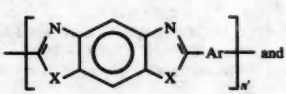


wherein x' is 5 or 6, and

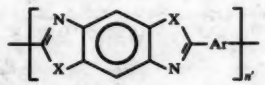


wherein n is an integer having a value such that the coil-like polymer has an intrinsic viscosity of about 1 to about 5 dl/g as determined in methanesulfonic acid at 30° C., and

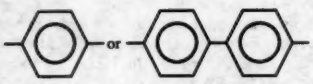
said aromatic heterocyclic rigid rod polymer comprising repeating units having a structural formula selected from the group consisting of



and



wherein X is NH, Nϕ, ϕ, S, where ϕ is phenyl, and Ar is



and n' is an integer having a value such that the rigid rod polymer has an intrinsic viscosity of about 10 to 40 dl/g as determined in methanesulfonic acid at 30° C.

4,631,319

THERMOSETTING CYANATE RESIN AND THE USE THEREOF FOR THE PRODUCTION OF COMPOSITE MATERIALS AND IPNS

Johannes Blahak; Rolf Dhein, both of Krefeld; Lothar Preis, Bergisch-Gladbach, and Manfred Schreckenberg, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 1, 1985, Ser. No. 718,800

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1984, 3413547

Int. Cl.[4] C08L *67/02;* **C08G** *63/18*

U.S. Cl. 525—437 **7 Claims**

1. A thermosetting resin which comprises:

(a) at least one polycyanate and

(b) from 1 to 40%, by weight, based on (a), of at least one polyester having a hydroxyl number of from 28 to 320, a number average molecular weight $\overline{M}_n$ of from 700 to 8000 and containing from 50 to 92%, by weight, of alcohol residues, acid residues, or both with each of said residues containing cycloaliphatic moieites.

4,631,320

COATING COMPOSITIONS CONTAINING POLYURETHANE OR POLYUREA POLYMERS AND AMINO RESINS

Girish G. Parekh, Fairfield, and Werner J. Blank, Wilton, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 17, 1984, Ser. No. 581,015

Int. Cl.[4] C08F *283/04;* **C08G** *2/00, 12/02*

U.S. Cl. 525—452 **17 Claims**

1. A thermosettable coating composition comprising:

(a) a polymer selected from the class consisting of one or more of hydroxy group-containing polyurethane, hydroxy group-containing polyurea and hydroxy group-containing polyurethane/polyurea polymers;

(b) an amino cross-linker; and

(c), optionally, an acid catalyst; wherein the polymer (a) is the reaction product of one or more reaction routes selected from the class consisting of (i) self-condensation of a poly-hydroxyalkyl carbamate compound, (ii) condensation of a poly-hydroxyalkyl carbamate compound with a polyol, and (iii) condensation of a poly-hydroxyalkyl carbamate compound with a polyamine.

4,631,321

ALKENYL ORGANOPOLYSILOXANE AND CURABLE COMPOSITION THEREFROM

Toshio Suzuki, Ichihara, Japan, assignor to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1985, Ser. No. 703,639

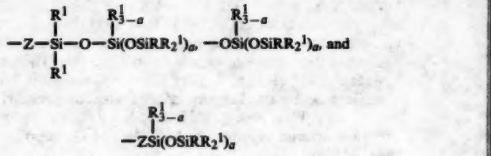
Claims priority, application Japan, Feb. 28, 1984, 59-37112

Int. Cl.[4] C08L *83/06;* **C08G** *77/04*

U.S. Cl. 525—478 **13 Claims**

1. A curable organopolysiloxane composition comprising

(a) organopolysiloxane in which at least the molecular chain ends possess groups with a general formula selected from the group consisting of



wherein R is an alkenyl group, R^1 is a monovalent organic group selected from the group consisting of alkyl, alkenyl, alkoxy, aryl, and halogenated alkyl, Z is an alkylene group, and a is 2 or 3,

(b) organohydrogenpolysiloxane which contains at least two silicon-bonded hydrogen atoms per molecule, and

(c) a catalytic quantity of platinum or a platinum-type compound, in said curable organopolysiloxane composition the blending ratio of (a) to (b) is such that the total alkenyl groups in (a) to total silicon-bonded hydrogen atoms in (b) is in a molar ratio of from 1:0.1 to 1:10.

4,631,322

CURABLE COMPOSITION OF PHENOLIC RESIN AND POLYETHER CONTAINING SILICONE CONTAINING REACTIVE GROUP

Katsuhiko Isayama; Toshifumi Hirose; Takahisa Iwahara, and Fumio Kawakubo, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

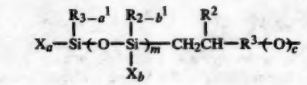
Filed Apr. 8, 1985, Ser. No. 721,017

Claims priority, application Japan, Apr. 9, 1984, 59-70508

Int. Cl.[4] C08L *61/10, 61/14, 71/02*

U.S. Cl. 525—480 **7 Claims**

1. A curable composition comprising (A) a phenol resin selected from the group consisting of a resol phenol resin, a modified resol phenol resin, a novolak phenol resin and a modified novolak phenol resin, said novolak phenol resins containing a curing agent, and (B) 1 to 200 parts by weight of, per 100 parts by weight of the phenol resin, a polyether having at least one silicon-containing reactive group in its molecule, the main chain of said polyether consisting essentially of recurring units of the formula —R—O—, wherein R is a bivalent alkylene group having 2 to 4 carbon atoms, and said silicon-containing reactive group being a group of the formula:



wherein X is hydroxyl group or a hydrolyzable group, R^1 is a monovalent hydrocarbon group having 1 to 20 carbon atoms or an organosiloxy group, a is 0, 1, 2 or 3, b is 0, 1 or 2, m is 0 or an integer of 1 to 18, R_2 is hydrogen or a monovalent organic group having 1 to 20 carbon atoms, R_3 is a bivalent organic group having 1 to 20 carbon atoms, and c is 0 or 1, with the proviso that a and b are not both zero at the same time.

4,631,323

METHOD OF MAKING CONDUCTING POLYMER COMPLEXES OF N-SUBSTITUTED CARBAZOLES AND SUBSTITUTED BENZALDEHYDES

Samson A. Jenekhe, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 29, 1985, Ser. No. 760,028

Int. Cl.[4] C08F *283/00;* **C08L** *61/00*

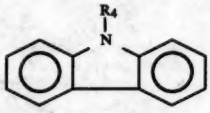
U.S. Cl. 525—509 **11 Claims**

1. A method of making a conductive polymer complex comprising the steps of

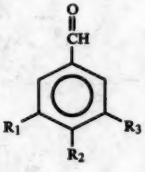
reacting a mixture of carbazole or an N-substituted carba-

zole and benzaldehyde or a substituted benzaldehyde in a first solvent in the presence of a protic acid catalyst at a temperature below the boiling point of said solvent and for a period of time commensurate with the degree of polymerization desired to form a copolymer thereof;

wherein said benzaldehyde or N-substituted carbazole is selected from the following fomulae;



wherein R_4 is H, CH_3, C_2H_5 or $Si(CH_3)_3$ and said substituted benzaldehyde is selected from the following formulae;



wherein

R_1 is H, CH_3, F, Cl or Br

R_2 is H, CH_3, F, Cl, Br, OH, NO_2, $-OCH_3$ or $-S-CH_3$

R_3 is H, CH_3, F, Cl or Br

precipitating the polymer in a non-solvent;

doping said polymer by exposure to a compatible charge transfer donor or acceptor selected from the group of sources or dopant counter ions consisting of I_2, Br_2, Cl_2, Hl, HBr, HCl, SO_3, ClO_4^-, HSO_4^-, $FeCl_4^-$, $SO_3CF_3^-$, $COOCF_3^-$, $C_6H_2(NO_2)SO_3^-$, $Cr_6H_4SO_3^-$, AsF_6^-, SbF_6^-, BF_4^-, FCl_4, Na^+, Li^+ or K^+.

4,631,324

PROCESS FOR THE PRODUCTION OF PASTE-FORMING POLYMERS OF VINYL CHLORIDE

Burkhard Boeke, Haltern, and Josef Kalka, Herten, both of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jan. 9, 1985, Ser. No. 689,517

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3210891

Int. Cl.⁴ C08F 2/24

U.S. Cl. 526—212 **17 Claims**

1. In a process for producing a paste-forming polymer of vinyl chloride and 0–30 wt. % of a copolymerizable monomer comprising discontinuously polymerizing the monomers in the presence of a water-soluble catalyst and an emulsifier system, the improvement comprising,

adding to the polymerization charge during the polymerization period, batchwise or continuously, an emulsifier system comprising:

(a) 0.2–3% by weight based on the total weight of the monomers, of an alkali metal or ammonium salt of an alkyl sulfonic acid of 10–20 carbon atoms in the alkyl group, of an alkylbenzene sulfonic acid of 8–18 carbon atoms in the alkyl group, or of a sulfonated succinic acid diesterified by a C_{6-14}-alkanol; and

(b) 50–200% by weight, based on the amount of component (a) of a C_{14}–C_{20}-alkanol,

whereby at a conversion of 50%, at most half of the emulsifier system is added.

4,631,325

ACCELERATOR COMBINATIONS FOR ANAEROBIC POLYMERIZATION

John R. Ray, Allison Park, Pa.; Michael A. Williamson, Washington, D.C., and James D. B. Smith, Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 15, 1985, Ser. No. 755,118

Int. Cl.⁴ C08F 4/00, 4/40, 20/20

U.S. Cl. 526—220 **10 Claims**

1. A curable composition comprising:

(A) an anaerobically polymerizable prepolymer containing acrylic material; and

(B) a complex of free radical initiator and accelerator, said accelerator comprising a complex of tertiary amine containing at least one aryl ring structure, and sulfur dioxide.

4,631,326

CURABLE FLUORINE-CONTAINING COPOLYMER AND COATING LIQUID COMPOSITION USING SAME

Toshio Koishi, Sakado, and Takashi Yasumura, Fujimi, both of Japan, assignors to Central Glass Company Limited, Ube, Japan

Filed Aug. 22, 1985, Ser. No. 768,244

Claims priority, application Japan, Aug. 30, 1984, 59-179174

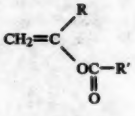
Int. Cl.⁴ C08F 214/18

U.S. Cl. 526—249 **12 Claims**

1. A curable copolymer comprising:

25 to 75 mol % of first repeating units which originate from chlorotrifluoroethylene;

10 to 70 mol % of second repeating units which originate from a fatty acid ester represented by the general formula (I),



(I)

wherein R represents hydrogen atom or methyl group and R′ represents an alkyl group having 1 to 12 carbon atoms; and

3 to 40 mol % of third repeating units which originate from a hydroxyl-containing allyl ether represented by the general formula (II),

$$CH_2=CH-CH_2-O-CH_2CH_2O_nH \quad \text{(II)}$$

wherein n is an integer from 1 to 6.

4,631,327

β-ELIMINATION POLYMERS USEFUL FOR PROVIDING DIFFUSION CONTROL LAYERS IN DIFFUSION TRANSFER PHOTOGRAPHIC PRODUCTS

Avinash C. Mehta, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 454,447, Dec. 29, 1982, Pat. No. 4,461,824.

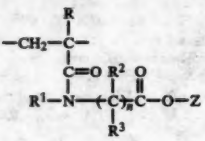
This application Jul. 10, 1984, Ser. No. 629,473

The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.

Int. Cl.⁴ C08F 28/02, 28/06, 22/38

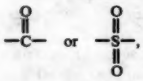
U.S. Cl. 526—256 **3 Claims**

1. A polymer comprising recurring units having the formula



wherein R is hydrogen, halogen or lower alkyl; R^1 is hydrogen or lower alkyl; R^2 and R^3 are independently hydrogen, lower alkyl, substituted lower alkyl, aryl, alkaryl, aralkyl, cycloalkyl, or R^2 and R^3 together with the carbon atoms to which they are bonded constitute a carbocyclic or heterocyclic ring, or R^3, when substituted on the methylene carbon atom next adjacent the nitrogen atom, is taken together with R^1 to form part of a substituted or unsubstituted N-containing ring; and n is a positive integer one to six; and Z is a cyclic β-elimination moiety and having the formula

wherein Y is



A represents the atoms necessary with Y to complete a four- to seven-membered ring structure, and D and E are independently hydrogen, methyl or phenyl, provided that not more than one of D and E is methyl or phenyl, or said cyclic β-elimination moiety is a moiety having the formula

wherein A and E together represent the atoms necessary to complete with the carbon atoms to which they are bonded a five-, six- or seven-membered ring structure, D is hydrogen, methyl or phenyl, and Y is an activating group for said β-elimination reaction.

4,631,328

POLYMERS CONTAINING MESOGENIC GROUPS AND DYE RADICALS IN THE SIDE CHAINS

Helmut Ringsdorf, Mainz; Michael Portugall, Wachenheim; Hans W. Schmidt, Mainz, and Karl H. Etzbach, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

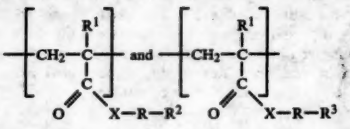
Continuation of Ser. No. 475,642, Mar. 15, 1983, abandoned. This application Dec. 26, 1984, Ser. No. 685,213

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1982, 3211400

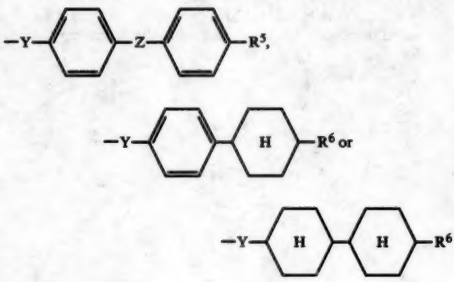
Int. Cl.[4] **C08F** *26/06, 20/70;* **C02F** *1/13;* **C09K** *19/52*

U.S. Cl. 526—259 **6 Claims**

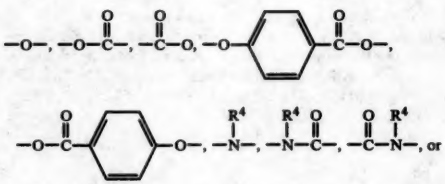
1. A polymer, wherein the polymer chain comprises monomers of the formula:



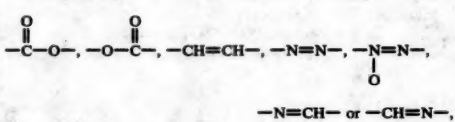
wherein R^1 is hydrogen or methyl, X is —O— or —N—R^4; R is a linear or branched C_2–C_{12}-alkylene group which is uninterrupted or interrupted by one or more of the groups —O—, —S— or —N—R^4; R^2 is a radical of the formula:



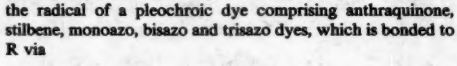
where Y is



and Z is a chemical bond or



R^5 is hydrogen, C_1–C_{12}-alkyl, C_5–C_7-cycloalkyl, C_1–C_{12}-alkoxy, C_1–C_{12}-alkoxycarbonyl, C_2–C_{12}-alkanoyloxy, fluorine, chlorine, bromine, cyano or nitro, and R^6 is hydrogen, C_1–C_{12}-alkyl, C_1–C_{12}-alkoxy or C_1–C_{12}-alkoxycarbonyl; R^3 is the radical of a pleochroic dye comprising anthraquinone, stilbene, monoazo, bisazo and trisazo dyes, which is bonded to R via



or an imide group; and R^4 is hydrogen or unsubstituted or substituted C_1–C_4-alkyl, and which contains from 0.1 to 40% by weight, based on the polymer, of the R^3 dye radicals.

4,631,329

MOISTURE RESISTANT POLYURETHANES DERIVED FROM NON-AROMATIC DIISOCYANATES

Gerald A. Gornowicz, and Chi-Long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 29, 1985, Ser. No. 802,880
Int. Cl.[4] C08G 18/38
U.S. Cl. 528—28 20 Claims

1. A method for preparing a polyurethane exhibiting a hardness of less than 90 on the Shore A durometer scale and retention of useful tensile properties at a relative humidity greater than 50%, said method comprising heating a reaction mixture comprising an aliphatic or cycloaliphatic diisocyanate, a diol or diamine chain extender and at least one polyol for a period of time sufficient to form said polyurethane, wherein the molar ratio of the combination of said diisocyanate and chain extender to all isocyanate-reactive ingredients other than said chain extender is at least 4:1, respectively, and isolating the resultant polyurethane from said reaction mixture.

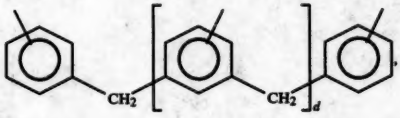
4,631,330

ADDITION COMPOUNDS AND PROCESS FOR THEIR PREPARATION

Erwin Dietz, Kelkheim; Albert Münkel, Frankfurt am Main; Otmar Hafner, Glashütten; Wolfgang Rieper, Frankfurt am Main, and Adolf Kroh, Selters, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 16, 1985, Ser. No. 809,529
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 3446084
Int. Cl.[4] C08G 18/38
U.S. Cl. 528—49 10 Claims

1. An addition compound comprising
50 equivalent % of structural units R of the formula



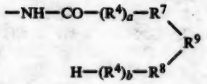
5 to 40 equivalent % of structural units of the formula (I)

$$-NH-CO-R^1-R^3-R^2 \quad (I)$$

5 to 40 equivalent % of structural units of the formula (II)

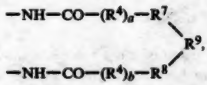
$$-NH-CO-(R^4)_a-R^5-R^6 \quad (II)$$

0 to 25 equivalent % of structural units of the formula (III)



(III)

and/or
0 to 25 equivalent % of structural units of the formula (IV)



(IV)

where (III) and (IV) cannot be 0 equivalent % at the same time and the sum (I)+(II)+(III)+(IV) is 50 equivalent %, having a molecular weight of 1,500 to 25,000, soluble in inert solvents, where d stands for a whole number from 0 to 6,

R^1 stands for a direct bond, —O—, $-NR^{10}R^{11}$—, in which R^{10} denotes a direct bond or C_1–C_{20}-alkylene and R^{11} denotes —H, —OH or $-NH_2$,

R^2 stands for —H, —OH or $-N(R^3R^{11})(R^{10}R^{12})$, in which R^{10} and R^{11} have the above meaning and R^{12} denotes —H, —OH or $-NH_2$ and

R^3 denotes a direct bond or C_1–C_6-alkylene, or

R^2 stands for a saturated or unsaturated heterocyclic or an aromtic ring system having 2 to 16 carbon atoms which may be substituted by $-R^{13}$, halogen, $-OR^{13}$, $-NR^{13}R^{14}$, $-COOR^{13}$, $-CONR^{13}R^{14}$, $-NR^{13}-COR^{14}$, —CN, $-CF_3$ or $-NO_2$,

where

R^{13} and R^{14} denote independently of each other —H or C_1–C_4-alkyl and where at least one of the radicals R^1 and R^2 must contain a nitrogen atom and R^1 is a direct bond only when R^2 stands for a heterocyclic ring system which is attached via the ring nitrogen, and R^3 likewise stands for a direct bond,

R^4 stand independently of each other for $-O-R^{15}-$, $-O-R^{15}-CO-$ or $-O-R^{15}-O-CO-R^{16}-CO-$,

where

R^{15} denotes C_2–C_{20}-alkylene or phenylethylene and

R^{16} denotes a direct bond, C_1–C_{12}-alkylene, C_6–C_{12}-arylene or C_6–C_{12}-aralkylene and where the radicals R^4 in the formulae (II), (III) and (IV) can in each case be different,

a stands for a whole number from 2 to 200,

R^5 stands for —O—, —S—, —NH— or —NR'—, where R' has one of the meanings mentioned for R^6,

R^6 stands for a monovalent aliphatic, aromatic or araliphatic radical having 1 to 40 carbon atoms, and

R^7 and R^8 stand independently of each other for —O—, —S—, —NR"— or a direct bond, where R" has one of the meanings mentioned for R^6,

R^9 stands for a direct bond or a divalent aliphatic or araliphatic radical having 2 to 200 carbon atoms,

where

R^7, R^8 and R^9 are not a direct bond at the same time, and

b stands for a whole number from 2 to 200.

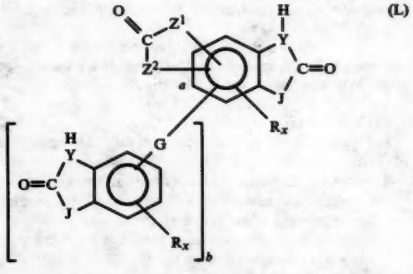
4,631,331

USE, AS LATENT CROSS-LINKERS FOR EPOXY RESINS, OF COMPOUNDS WHICH CAN BE REARRANGED IN SITU TO DIFUNCTIONAL PHENOLS

Theodore L. Parker, Lafayette, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 9, 1985, Ser. No. 763,866
Int. Cl.[4] C08G 59/02
U.S. Cl. 528—96 25 Claims

1. A latent epoxide composition comprising a polyepoxide and a benzo-N-heterocyclic compound which is a latent, phenolic chain extender or cross-linker for polyepoxides, said compound being of the formula



(L)

wherein

one of a and b is zero and the other is zero or 1;

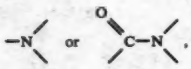
one of Z^1 and Z^2 is YH and the other is J and, when a=1, Z^1 and Z^2 are attached to adjacent ring carbons;

x, independently in each occurrence, is 0, 1 or 2;

R is a non-interfering substituent, independently the same or different in each occurrence;

G is a valence bond, an alkylene or alkenylene group—optionally halosubstituted, CO, O, S, SO, SO_2, SiO_2;

Y is



independently in each occurrence;

J is O or S, independently in each occurrence;

and the number of Y—H groups in the molecule is 1 or 2.

4,631,332

USE OF BENZO-N-HETEROCYCLES TO ADVANCE EPOXY RESINS

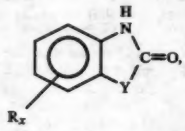
Theodore L. Parker, Lafayette, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 8, 1985, Ser. No. 796,145

Int. Cl.⁴ C08G *59/02*

U.S. Cl. 528—117 **25 Claims**

1. The process for advancing a difunctional epoxide which comprises reacting the epoxide, in the presence of an advancement catalyst, with from about 0.33 to about 1 molecular proportions of a benzo-N-heterocycle of the formula



(I)

wherein Y is NH, O or S and each of R^1, R^2, R^3 and R^4, independently, is H or a non-interfering substituent, and x is zero, 1 or 2.

4,631,333

PROCESS FOR THE PREPARATION OF POLYIMIDE ESTERS OF TRIMELLITIC ACID

Hans R. Kricheldorf; Ralf Pakull, both of Hamburg, and Hans-Rudolf Dicke, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 30, 1985, Ser. No. 760,461

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1984, 3429680; Feb. 9, 1985, 3504481

Int. Cl.⁴ C08G *73/16*

U.S. Cl. 528—170 **4 Claims**

1. Process for the preparation of homo and copolyesters of N-(hydroxyaryl)-trimellitic acid imides which comprises

(a) reacting trimellitic acid anhydride and an aminophenol in a vessel in a solvent at 40° to 150° C. to produce the corresponding trimellitic acid amide and

(b) in said vessel the amide is then cyclized and polycondensed with a dehydrating agent at 200° to 400° C. in the presence of a high boiling reaction medium.

4,631,334

OPTICAL ARTICLES OF BRANCHED POLYCARBONATE RESIN

Mitsuhiko Masumoto; Shigeo Yanada, both of Osaka; Toshiaki Izumida, Hyogo, and Kazuyuki Akahori, Osaka, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Japan

Filed Apr. 10, 1985, Ser. No. 721,604

Claims priority, application Japan, Apr. 10, 1984, 59-71287; Apr. 10, 1984, 59-71288

Int. Cl.⁴ C08G *63/62*

U.S. Cl. 528—202 **6 Claims**

1. An optical article comprising a molding of a branched polycarbonate resin having a viscosity average molecular weight in the range of from 13,000 to 20,000 and having a Q value of at least 30×10^{-2} cc/sec produced by injection molding at a resin temperature of from 280° to 360° C., said branched polycarbonate resin being produced from (1) at least one dihydric phenol compound, (2) a polyfunctional organic compound having at least two phenolic hydroxyl groups as a branching agent in an amount of from 0.1 to 1 mol% based on the amount of said dihydric phenol compound, and (3) a terminator in an amount of from 4.4 to 8.0 mol% based on the amount of said dihydric phenol compound.

4,631,335

POLYIMIDE OF ALKYLENE DIAMINE AND 4,4'(HEXAFLUOROISOPROPYLIDENE)BIS(O-PHTHALIC ANHYDRIDE)

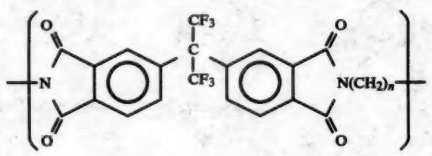
Daniel A. Scola, Glastonbury, Conn., and Ruth H. Pater, Rocky River, Ohio, assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 24, 1984, Ser. No. 685,937

Int. Cl.⁴ C08G *73/10*

U.S. Cl. 528—353 **5 Claims**

1. A polyimide having repeating polymer units of the formula



wherein n is 2 to about 20 and the molecular weight of the polymer chain is such that the polymer absorbs below about 0.2% by weight moisture at room temperature.

4,631,336

PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT, OPTIONALLY BRANCHED POLYARYLENE SULPHIDE WITH AN ESTER OR ANHYDRIDE OF A CARBOXYLIC ACID

Karsten Idel, Krefeld; Edgar Ostlinning, Duesseldorf, and Dieter Freitag, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 1, 1985, Ser. No. 761,369

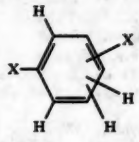
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1984, 3428986

Int. Cl.⁴ C08G *75/16*

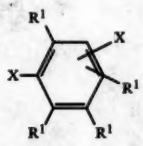
U.S. Cl. 528—388 **15 Claims**

1. A process for the production of a high molecular weight polyarylene sulphide or branched polyarylene sulfide which comprises reacting a mixture of components of:

(a) from 50 to 100 mol-% of an aromatic dihalogen compound corresponding to the following formula:



and from 0 to 50 mol-% of an aromatic dihalogen compound corresponding to the following formula:



wherein

X represents halogens in the meta- or para-position to each other; and each

R^1 is independently hydrogen, alkyl, cycloalkyl, aryl, alkylaryl, arylalkyl, or two groups R^1 in the orthoposition to each other joined together to form an aromatic or heterocyclic ring, with the proviso that at least one R^1 is not hydrogen; and

(b) from 0 to 5 mol-%, based on the sum of components (a) and (b), of an aromatic tri- or tetra-halogen compound corresponding to the following formula:

$$ArX^1_n$$

wherein

Ar represents an aromatic or heterocyclic group;

X^1 represents chlorine or bromine; and

n represents 3 or 4; and

(c) an alkali metal sulphide, in which the molar ratio of (a+b):c is from 0.5:1 to 1.5:1; in

(d) an organic solvent; in the presence of from 0.5 to 100 mol-%, based on the moles of aromatic dihalogen compounds (I) and (II), of

(e) an ester or anhydride of a carboxylic acid.

4,631,337

HYDROLYTICALLY-STABLE DENSE STAR POLYAMINE

Donald A. Tomalia, Midland, and James R. Dewald, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 641,807, Aug. 17, 1984, Pat. No. 4,568,737, which is a continuation-in-part of Ser. No. 565,686, Dec. 27, 1983, Pat. No. 4,558,120, and a continuation-in-part of Ser. No. 456,226, Jan. 1, 1983, Pat. No. 4,507,466. This application Jul. 15, 1985, Ser. No. 755,259

Int. Cl.[4] C08G *73/00*

U.S. Cl. 528—391 **21 Claims**

1. A dense star polyamine having at least one core branch emanating from a core, each core branch having at least one terminal amine group provided that (1) the ratio of terminal amine groups to the branches emanating from the core is 2:1 or greater, (2) the density of terminal amine groups in the dense star polyamine is at least 1.5 times that of an extended conventional star polyamine having similar core and monomeric moieties and a comparable molecular weight and number of core branches wherein each of such branches of the conventional star polyamine bears only one terminal amine group, and (3) a molecular volume that is equal to or less than 80 percent of the molecular volume of said extended conventional star polyamine.

4,631,338

PROCESS FOR THE ISOLATION OF THERMOPLASTIC POLYCARBONATE FROM SOLUTION WITH VAPOR OF BENZENE OR ALKYLBENZENE

Karl-Heinrich Meyer, Krefeld; Uwe Hucks, Alpen, and August Horsthemke, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,209

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3429960

Int. Cl.[4] C08G *63/62*

U.S. Cl. 528—483 **9 Claims**

1. A process for the isolation of a thermoplastic polycarbonate based on bisphenol A, which is prepared by the phase boundary process, from a solution containing an organic solvent comprising (i) continuously treating a solution of said polycarbonate in said organic solvent with a vapor of at least one member selected from the group consisting of benzene and alkylbenzene, said member being characterized in that polycarbonate is sparingly soluble or insoluble therein at room temperature and further in that its boiling point is lower than that of said organic solvent, until said organic solvent is evaporated off down to a residual content of less than 0.5% by weight based on the total weight of the mixture of said polycarbonate and said member and (ii) isolating said polycarbonate either as a melt from said mixture by evaporating off said member under pressure or by solidifying said mixture and removing said member by drying.

4,631,339

1,3,5-TRIAZEPINONES

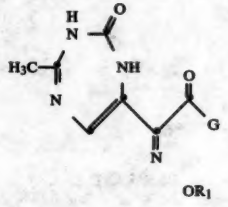
William J. Wheeler, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 486,132, Apr. 18, 1983, Pat. No. 4,514,564. This application Feb. 13, 1985, Ser. No. 701,060

Int. Cl.[4] C07D *255/02*

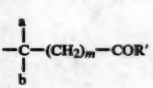
U.S. Cl. 540—492 **7 Claims**

1. A compound of the formula



wherein:

R_1 is C_1 to C_4 alkyl, a carboxy-substituted alkyl, an amido-substituted alkyl, an amido-substituted cycloalkyl or carboxy-substituted cycloalkyl group represented by the formula

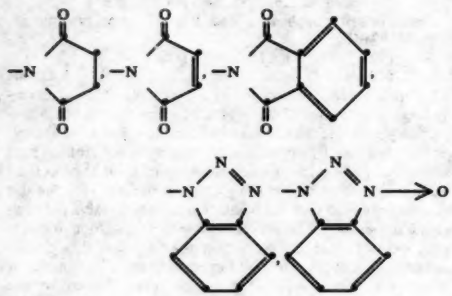


wherein m is 0 to 3, a and b when taken separately are independently hydrogen or C_1 or C_3 alkyl, or when taken together with the carbon to which they are attached form a C_3 to C_7 carbocyclic ring; R' is hydroxy, amino, C_1 to C_4 alkoxy, or —OR", where R" is 2-iodoethyl, tert-butyl, 2,2,2-trichloroethyl, 4-methoxybenzyl, 4-nitrobenzyl, diphenylmethyl, allyl, 4-methoxydiphenylmethyl, 4,4'-dimethoxydiphenylmethyl, benzyl, trialkylsilyl, 2,4,6-trimethyoxybenzyl, trityl, 4-methoxytrityl, 4,4'-dimethoxytrityl, or 4,4',4"-trimethoxytrityl; G is

chloro, bromo, hydroxy, C_1 to C_4 alkoxy, phenoxy, or a group of the formula

—O—J

wherein J is p-nitrophenyl, 2,4-dinitrophenyl, pentachlorophenyl, a group of the formula



methoxycarbonyl, iso-butoxycarbonyl, pivaloyl, or trichloroacetyl; or a group of the formula

$-O^{\ominus}M^{\oplus}$

wherein $M^{\oplus}$ is lithium, sodium, potassium, ammonium, dibenzyl ammonium, benzylammonium, phenylethylbenzylammonium, 2-hydroxyethylammonium, or dicyclohexylammonium.

4,631,340

1,4-OXAZINONE DERIVATIVES

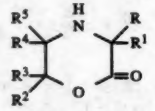
Vassil S. Georgiev, Rochester, and George B. Mullen, Avon, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 647,787, Sep. 6, 1984, Pat. No. 4,549,014. This application Oct. 18, 1985, Ser. No. 789,270

Int. Cl.[4] C07D *265/32*

U.S. Cl. 544—171 **8 Claims**

1. A 1,4-oxazinone derivative of the formula



wherein R and R^1 together represent the group $=CHCO_2R^6$ where R^6 is alkyl, R^2 and R^3 are hydrogen or phenyl, and R^4 and R^5 are hydrogen, alkyl or benzyl, provided that when both R^2 and R^3 are hydrogen, at least one of R^4 and R^5 is benzyl and when R^4 and R^5 are either hydrogen or alkyl, at least one of R^2 and R^3 is phenyl.

4,631,341

ANTHRAQUINONE COMPOUND HAVING BOTH MONOHALOGENOTRIAZINYL AND VINYLSULFONE TYPE FIBER REACTIVE GROUPS

Yutaka Kayane, Ibaraki; Takashi Omura, Ashiya; Katsumasa Otake, Nara, and Akira Takeshita, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

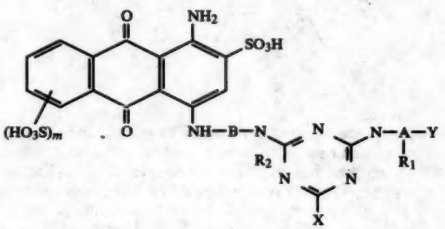
Filed May 16, 1984, Ser. No. 610,750

Claims priority, application Japan, May 23, 1983, 58-91215; May 25, 1983, 58-092944; Oct. 26, 1983, 58-201835

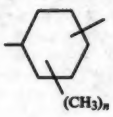
Int. Cl.[4] C07D *251/50*

U.S. Cl. 544—189 **4 Claims**

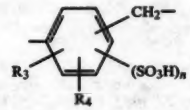
1. A compound, or a salt thereof, represented by the formula,



wherein X is a halogen atom, Y is $-SO_2CH=CH_2$ or $-SO_2CH_2CH_2Z$, wherein Z is selected from the group consisting of sulfuric acid ester; thiosulfuric acid ester; phosphoric acid ester; acetic acid ester; and a halogen atom, A is a phenylene group unsubstituted or substituted with one or two members selected from the group consisting of bromine and chlorine atoms, methyl, ethyl, methoxy, ethoxy and sulfo groups, or a naphthalene group unsubstituted or substituted with one sulfo group, B is a cycloalkylene group of the formula,



an arylene group of the formula,



or an alkylene of the formula $-(CH_2)_l-$, wherein R_3 and R_4 are independently a hydrogen atom or a methyl, ethyl or methoxy group, n is 0, 1 or 2 and l is an integer of 2 to 6, R_1 and R_2 are independently a hydrogen atom, an unsubstituted lower alkyl group or a substituted lower alkyl group substituted by hydroxy, cyano, alkoxy, carboxy, carbamoyl, alkoxycarbonyl, alkylcarbonyloxy, sulfo, sulfomoyl or halogen atoms, and m is 0, 1 or 2, provided that the group Y is located at m- or p-position to the group

when B is the arylene group.

4,631,342
PROCESS FOR PRODUCING 5-FLUOROURACIL

Teruo Umemoto, Kanagawa, and Eiji Ogura, Tokyo, both of Japan, assignors to Onoda Cement Company, Ltd., Yamaguchi and Sagami Chemical Research Center, Tokyo, both of, Japan

Filed Mar. 7, 1985, Ser. No. 709,284
Claims priority, application Japan, Mar. 9, 1984, 59-43779
Int. Cl.[4] C07D *239/22*
U.S. Cl. 544—313 **6 Claims**

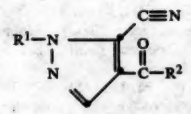
1. A process for producing 5-fluorouracil comprising reacting uracil in an aqueous phosphoric acid solution with elemental fluorine and heating the resultant intermediate reaction solution.

4,631,343
CYANOPYRAZOLE INTERMEDIATES

James R. Beck, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

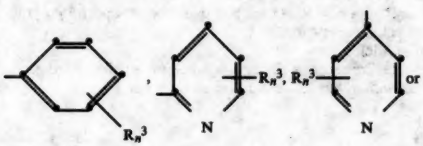
Continuation-in-part of Ser. No. 549,111, Nov. 7, 1983, abandoned. This application Sep. 13, 1984, Ser. No. 650,160
Int. Cl.[4] C07D *401/04, 231/14*
U.S. Cl. 546—279 **15 Claims**

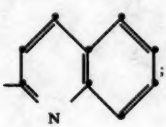
1. A compound of the formula



wherein

R^1 is C_5–C_6 cycloalkyl,





R^2 is halogen, hydroxy or C_1–C_6 alkoxy;

each R^3 is independently halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy or cyano; and n is 0–3;

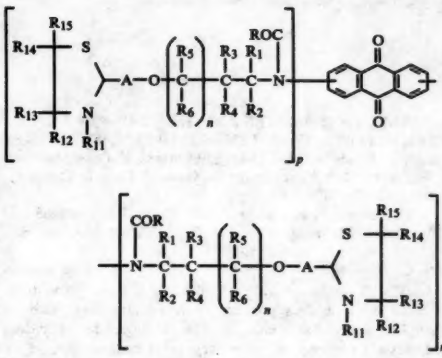
with the proviso that when R_3 is C_1–C_4 alkyl, that substituent exists at other than the 2 or 6 position of the phenyl ring.

4,631,344
PHOTOGRAPHIC PRODUCTS AND PROCESSES

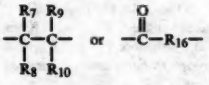
Myron S. Simon, West Newton, and David P. Waller, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 644,915, Aug. 27, 1984, Pat. No. 4,535,051. This application Apr. 29, 1985, Ser. No. 728,210
Int. Cl.[4] C07D *277/04, 277/06*
U.S. Cl. 548—146 **6 Claims**

1. A compound represented by the formula



wherein R is hydrogen, alkyl having from 1 to 6 carbon atoms or phenyl or pyridyl; R_1, R_2, R_3, R_4, R_5 and R_6 are each independently hydrogen, alkyl having from 1 to 6 carbon atoms or phenyl; A is



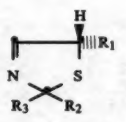
R_7, R_8 and R_9 are each independently hydrogen, alkyl having from 1 to 6 carbon atoms, phenyl, benzyl or phenethyl; R_{10} is hydrogen or carboxy; R_{11} is alkyl having from 1 to 6 carbon atoms, phenyl, benzyl or phenethyl; R_{12} is hydrogen, carboxy, dialkylcarboxamido, alkyl having from 1 to 6 carbon atoms, phenyl, benzyl or phenethyl; R_{13}, R_{14} and R_{15} are each hydrogen, alkyl having from 1 to 6 carbon atoms, phenyl, benzyl or phenethyl; R_{16} is alkylene having 2 or 3 carbon atoms or phenyl; n is 0 or 1; m is 1 or 2; and p is 0, 1 or 2.

4,631,345
THIAZOLE PRECURSORS FOR THE PREPARATION OF BIOTIN

Robert A. Volkmann, Ledyard, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 587,757, May 17, 1984, Pat. No. 4,581,459, which is a division of Ser. No. 379,247, May 17, 1982, Pat. No. 4,468,516. This application Feb. 18, 1986, Ser. No. 807,064
Int. Cl.[4] C07D *277/10, 471/10, 513/10, 277/60*
U.S. Cl. 548—147 **5 Claims**

1. A compound of the formula



or a boron trifluoride adduct thereof, wherein

R_1 is $—(CH_2)_4CH_3$,

$—(CH_2)_3OR$ or $—(CH_2)_5OR$ wherein R is alkyl,

$—(CH_2)_4CN$, or

$—(CH_2)_4COOR'$ wherein R' is alkyl or phenyl;

R_2 and R_3 when taken together are cycloalkyl or $—CH_2—CH_2—Y—CH_2—CH_2$ wherein Y is sulfur, oxygen or NR" wherein R" is COOR"' wherein R"' is alkyl, or

R_2 and R_3 when taken separately are each alkyl, cycloalkyl or phenyl provided that R_2 and R_3 are not both phenyl;

said alkyl having from 1 to 4 carbon atoms and said cycloalkyl having from 5 to 7 carbon atoms.

4,631,346

SILYL CARBAMATES AND THEIR USE IN THE PREPARATION OF BIS (AMINOALKYL) DISILOXANES

Jimmy L. Webb, Ballston Lake, and Cathryn E. Olsen, Ballston Spa, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 707,630, Mar. 4, 1985, abandoned. This application Aug. 22, 1985, Ser. No. 768,255

Int. Cl.[4] C07F 7/08, 7/10

U.S. Cl. 556—420 20 Claims

1. A silyl carbamate having formula I in the drawings, wherein R^1 is a C_{1-4} primary or secondary alkyl radical, phenyl or substituted phenyl; each R^2 is independently hydrogen, a C_{1-4} primary or secondary alkyl radical, phenyl or substituted phenyl; and m is from 1 to about 20.

4,631,347

DITHIOLPHOSPHORIC ACID ESTERS

Haruyasu Yamamoto, Takarazuka; Kiyoshi Kasamatsu, Toyonaka; Takayuki Okabe, Nishinomiya, and Kunio Mukai, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

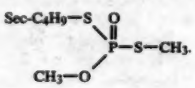
Filed Oct. 17, 1983, Ser. No. 542,709

Claims priority, application Japan, Oct. 25, 1982, 57-188004

Int. Cl.[4] C07F 9/165

U.S. Cl. 260—963 1 Claim

1. A dithiolphosphoric acid ester of the formula



4,631,348

PREPARATION OF ACETIC ACID

Nabil Rizkalla, River Vale, N.J., assignor to The Halcon SD Group, Inc., Little Ferry, N.J.

Continuation of Ser. No. 431,450, Sep. 30, 1982, abandoned. This application Jun. 19, 1985, Ser. No. 746,447

The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.

Int. Cl.[4] C07C 51/12, 51/353, 53/08

U.S. Cl. 562—607 4 Claims

1. A process for the preparation of acetic acid which comprises heating methyl formate with carbon monoxide in the presence of a molybdenum - nickel - alkali metal, a chromium - nickel - alkali metal or a tungsten - nickel - alkali metal cocatalyst component, and being free from organic promoters selected from the group consisting of organo-phosphorus compounds and organo-nitrogen compounds, and in the presence of an iodide or bromide.

4,631,349

HETEROGENEOUS CATALYST PROCESS

Dixie E. Goins, Orangeburg; Silas W. Holmes, Columbia, and Edward A. Burt, Orangeburg, all of S.C., assignors to Ethyl Corporation, Richmond, Va.

Filed Jun. 25, 1985, Ser. No. 748,733

The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.

Int. Cl.[4] C07C 37/14

U.S. Cl. 568—789 41 Claims

1. A process for alkylating phenols comprising reacting in a liquid reaction medium a mixture of:

(a) a phenol having at least one ortho or para position unsubstituted except for H;

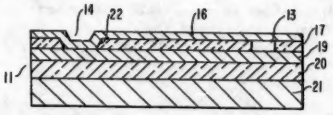
(b) an olefin; and

(c) a heterogeneous catalyst comprising an aluminum phenoxide bonded to a solid polymeric resin.

4,631,350
LOW COST THERMOCOUPLE APPARATUS AND METHODS FOR FABRICATING THE SAME

Damon Germanton, 7 Alberta Dr., Kennelon, N.J. 07405, and Donald Weiss, 200 Cliffside Park, Englewood, N.J. 07631

Filed Dec. 30, 1983, Ser. No. 567,377
Int. Cl.[4] H01L *35/28*
U.S. Cl. 136—225 7 Claims



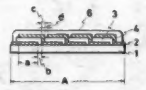
1. A thermocouple device, comprising:

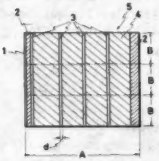
a planar plastic layer member of a rectangular configuration and having a given length greater than the width, said member having disposed on said surface a first thin layer of a thermocouple element metal completely covering the same, a layer of an insulator material disposed upon and completely covering said first thin layer of said thermocouple element metal, said insulating layer having a first aperture near one end and located above a center line parallel to said longer sides, and a second aperture at said other end and located below said center line, each of said apertures directed through said insulating layer to directly contact said first metal layer, a second thin layer of a different thermocouple metal disposed on top of said insulating layer and positioned above said center line and directed from one end to the other along the length to overlie said first aperture with said second metal layer contacting said first metal layer via said first aperture to form a hot junction for said thermocouple, with said second aperture in contact with said first layer forming one terminal of a reference junction and with the other terminal supplied by contact with said second metal layer at a point above said center line and adjacent to said second aperture.

4,631,351
INTEGRATED SOLAR CELL

Yoshihisa Tawada, and Kazunori Tsuge, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 21, 1985, Ser. No. 703,975
Claims priority, application Japan, Feb. 29, 1984, 59-39078
Int. Cl.[4] H01L *27/14*
U.S. Cl. 136—244 3 Claims





1. An integrated solar cell of cut-off construction, comprising

a transparent support,

a transparent electrode layer provided on said transparent support in the form of a plurality of elongated parallel bands,

a semiconductor layer disposed on said transparent electrode layer in the form of a plurality of elongated parallel bands so that each of said semiconductor bands does not cover one of the long sides of the corresponding transparent electrode band but extends beyond the other long side over said transparent support or the adjacent transparent electrode, and

a back side electrode disposed on said semiconductor layer in the form of a plurality of elongated parallel bands so that each of said back side electrode bands does not cover one of the long sides of the corresponding semiconductor band, which side corresponds to the uncovered side of said transparent electrode band, but extends beyond the other long side of said semiconductor band onto the adjacent transparent electrode band and may optionally extend onto the adjacent semiconductor band; wherein the relationship between the positions of said transparent electrode, said semiconductor layer, and said back side electrode are as follows:

$a > 20b$,

$a > 20c$, and

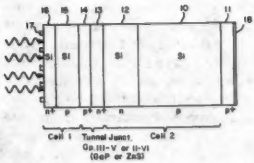
$a > 20d$

in which a is the space between the covered long side of said transparent electrode band and the opposite long side of said back side electrode band disposed through said semiconductor layer on said transparent electrode, b is the space between the covered long side of said transparent electrode band and the other long side of the adjacent transparent electrode band, c is the space between the covered long side of said semiconductor band and the other long side of the adjacent semiconductor band, and d is the space between the long side of the back side electrode band on the last mentioned covered side and the other long side of the adjacent back side electrode band; and said solar cell is obtained by cutting the above construction in the widthwise direction of said transparent electrode bands with an interval B so as to satisfy the relationship of $3B < A < 50B$ wherein A is the overall length of said integrated solar cell.

4,631,352
HIGH BAND GAP II-VI AND III-V TUNNELING JUNCTIONS FOR SILICON MULTIJUNCTION SOLAR CELLS

Taher Daud, La Crescenta, and Akaram H. Kachare, La Canada, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 17, 1985, Ser. No. 809,975
Int. Cl.[4] H01L *31/06, 27/14*
U.S. Cl. 136—249 2 Claims



1. A multijunction silicon solar cell comprising a plurality of p/n junction solar cells epitaxially grown in layers to receive

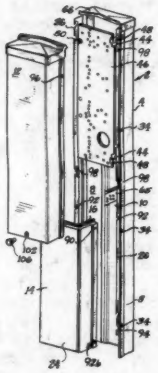
solar energy in series through the n-type layer of each solar cell and having the p-type layer of one connected to the n-type layer of the next in series by a p^+/n^+ tunnel junction of III-V or II-VI semiconductor material of higher band-gap than silicon, and having a near perfect lattice match with silicon.

4,631,353

TERMINAL PEDESTAL FOR BURIED CABLE INSTALLATION

Robert J. Marks, Carpentersville, Ill., assignor to Reliance Electric Company, Cleveland, Ohio

Filed Oct. 31, 1984, Ser. No. 666,760
Int. Cl.[4] H02G *9/02*
U.S. Cl. 174—16 R **10 Claims**



2. A closure for electrical terminals associated with a buried cable installation comprising: a body having a rear section including an extruded plastic channel having a web and a pair of legs with opposed edges defining an opening into the channel, means within the channel and integral with the plastic of the channel for supporting electrical wire termination structure, front cover means for closing the opening into said channel, said front cover means comprising upper and lower front cover sections, each being of a cross-section that is the same cross-sectional profile as that of said rear section, means for attaching said cover sections to said rear section with the legs of the rear section being presented respectively to the legs of the cover sections, brackets on the legs of said rear section, and means on the lower front cover section for snap-fitting engagement with said brackets.

5. A closure for electrical terminals associated with a cable installation comprising: a body having a rear section with an open side and front cover means for closing said open side, said front cover means including at least one front cover section, said front cover section having an upper end with a front cap section affixed hereto, a rear cap section affixed to the upper end of said rear section, the cap sections abutting and cooperating to define a cap for the upper end of said body, the abutting parts of the cap sections forming vent passageway means from the interior of the body to the exterior of the cap, and in which said cap sections have surfaces that are inclined to the vertical when the closure is installed in its normal upright position, said surfaces being positioned to receive and drain away from the closure condensate discharged from said vent passageway means.

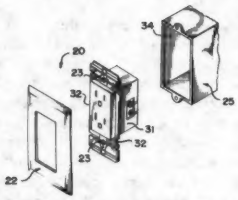
9. A closure for electrical terminals associated with a cable installation comprising: a body having a rear section including a channel having a web and a pair of legs with opposed edges defining an opening into the channel, cover means for said opening, said cover means and said rear section each having an upper end and with cap sections on each said upper end, said cap section on the upper end of the rear section overhanging said web on said rear section, and removable grommets on said web and projecting outwardly therefrom at least the amount of said overhang for enabling the grommets to serve as spacers when the closure is secured to a vertical surface with the grommets against said vertical surface.

4,631,354

COVER ASSEMBLY FOR ELECTRICAL OUTLET BOX

William C. Boteler, Bridgeport, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed May 13, 1985, Ser. No. 732,960
Int. Cl.[4] H02G *3/14*
U.S. Cl. 174—66 **16 Claims**



1. A cover assembly for an electrical outlet box, comprising:

a mounting strap having a longitudinal axis mounting an electrical device with a peripheral flange extending laterally therefrom adjacent a front face of the device, said mounting strap having opposite ends mounting a plurality of elongated lips with each lip being adjacent a different end of said strap, the lips being elongated in a direction substantially perpendicular to said longitudinal axis and extending substantially parallel to one another, a substantially planar, central section of said strap between said lips, each of said lips formed unitary with said strap and extending outwardly away from said central section at an acute angle relative to the plane of said central section; and

a cover plate having a substantially planar rearward surface and opposite ends and comprising a plurality of ledges each adjacent an opposite end of said plate for engaging different ones of said lips, each of said ledges of said cover plate being elongated and extending substantially parallel to one another and to said lips, said ledges being adjacent said rearward surface and inclined toward each other and being spaced apart laterally substantially the same distance as said lips; and

said plate being resilient and having a convex cross sectional portion, whereby pressing the convex portion towards said strap flattens said plate and permits said ledges to pass over said lips to and thereby couple said plate to said strap.

4,631,355

TELAUTOGRAPH SYSTEM

Joseph Federico, Berkeley Heights, and Sigurd G. Waaben, Princeton, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 18, 1984, Ser. No. 682,780
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—18 **8 Claims**

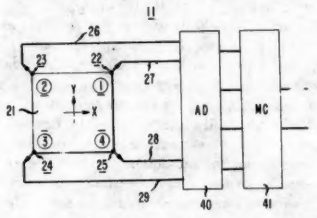
1. A terminal comprising

(a) first large area conductive means provided with at least three spaced apart localized electrode connections thereto,

(b) means under control of recording information for injecting current into a point in the first conductive means for flow in the first conductive means and for dividing among said at least three electrodes and supplying a separate

portion of the current to each of said at least three electrodes, and

(c) signal processing means, supplied with the separate current portions from at least the three electrodes, for processing the at least three current portions and deriving a pair of signals representative of the coordinates of the injection point.



4,631,356

COORDINATE INPUT DEVICE WITH DISPLAY

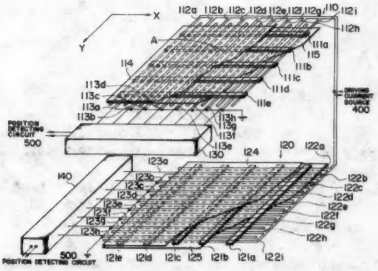
Yoshinori Taguchi, and Tsuguya Yamanami, both of Ageo, Japan, assignors to Wacom Co., Ltd., Saitama, Japan

Filed Mar. 1, 1985, Ser. No. 707,311

Claims priority, application Japan, Mar. 6, 1984, 59-41376

Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—19 4 Claims



1. A coordinate input device with a display comprising:

a tablet having an X-direction position detecting section having elongated magnetic bodies and a plurality of exciting lines and a plurality of detecting lines which are arranged alternatingly such as to cross said magnetic bodies orthogonally thereto, and a Y-direction position detecting section having a construction similar to that of said X-direction position detecting section and superposed thereon;

a tabular display superposed on said tablet;

a position appointing magnetism generator adapted for imparting local biases to said magnetic bodies of said X- and Y-direction position detecting sections;

a driving current source adapted to apply A.C. current of a predetermined frequency to said exciting lines of said X- and Y-direction position detecting sections;

a position detecting circuit for detecting the coordinate values of a position appointed by said position appointing magnetism generator through detection of voltages induced in said detecting lines in said tablet;

a display control circuit for driving said display; and

a processing means for controlling the operation of the constituents set forth above.

4,631,357

METHOD OF AND DEVICE FOR MONITORING A PLURALITY OF AUTOMATIC SELLING MACHINES

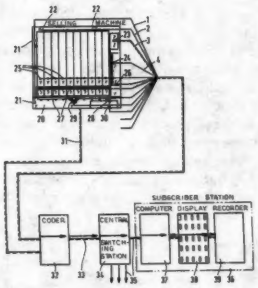
Dieter Grünig, Alpnach, Switzerland, assignor to Grünig Administration, Badger, Minn.

Filed Sep. 14, 1984, Ser. No. 651,699

Claims priority, application Switzerland, Sep. 14, 1983, 5020/83

Int. Cl.[4] H04Q *9/00;* H04M *11/00*

U.S. Cl. 379—40 3 Claims



2. A device for monitoring a plurality of automatic selling machines each having a plurality of sensors for delivering in response to a predetermined operational condition and/or interference in the machine an output signal, comprising a coding device for converting respective output signals from the sensors into corresponding codes, said sensors being connected to a power source, said power source being a low voltage source from a telephone network, a part of said plurality of sensors being directly connected to the coding device via conductors and the remaining sensors being connected to the coding device by different combinations of said conductors, said coding device generating composite coded signals by combining the coded output signals with a recognition code pertaining to particular selling machines and to a particular subscriber station, said coding device further converting the composite coded signals into different frequencies, a central switching station connected via telephone network to the coding device of each of said selling machines to receive said different frequencies, said central switching station decoding the recognition code pertaining to a subscriber station and switching over the coded output signal to a corresponding subscriber line, and a subscriber station connected to a subscriber line and including a computer for decoding the received output signals and processing the received message and displaying the message on a display and/or recording means.

4,631,358

DEVICE AND METHOD FOR ARTICLE STORAGE AND RELEASE

Thomas W. Newcome, III, 66 E. 9th St., St. Paul, Minn. 55101, and Mark H. Kartarik, 810 Thornton St., SE., Minneapolis, Minn. 55414

Filed Feb. 14, 1984, Ser. No. 579,669

Int. Cl.[4] G07F *11/00;* H04M *11/04*

U.S. Cl. 379—45 13 Claims

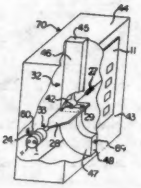
9. A method for storing and protecting an article for access to a predetermined user, said method comprising:

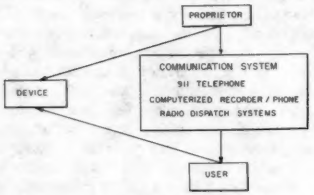
a. providing an automatically resetting and tamper resistant device for releasably storing an article from an internal secured location and for dispensing the article to an external location accessible to a user having been provided with a changeable predetermined code, said device comprising:

1. a tamper resistant structure having article storage

means therein and being accessible to the proprietor of the device, said structure further having an article input chute having a generally open flat bottom portion for receiving and holding the article therein,

2. a reciprocating tamper resistant article release means located spacially below said input chute in said tamper resistent structure and being in communication with an externally accessible location to a user,
3. a logic unit having changeable code setting means for a proprietor to enter a predetermined code, a code input means located at an externally accessible location for input of the predetermined code by a user and signal output means in communication with said article release means,
4. power source means in communication with said code setting means, logic unit, and code input means for activating said article release means to release the stored article to a user at the externally accessible location,
5. said reciprocating article release means further being comprised of a solenoid valve having activatable and reciprocating piston means having an elongated and generally flat chute cover means connected thereto and extending outwardly therefrom, said solenoid valve





being in communication with said signal output means, and said tamper resistant structure further having output chute means with a generally flat open top area in communication with the externally accessible location, said movable and reciprocating chute cover means for holding an article thereabove and being located spacially between said input and output chutes, said chute cover means further having an apertured portion extending therethrough, said apertured portion of said chute cover being located outside the top of said output chute when being in its set position and having its apertured portion aligned with the interior of said input and output chutes when activated to permit the article to pass therethrough,

6. said movable chute cover means additionally having resilient means attached in opposition to the solenoid valve piston movement so that said chute cover means is returnable to its original set position subsequent the activation of said solenoid valve to reset the chute cover with said aperture outside said input and output chutes for subsequent use, and
7. said article input chute further being disposed above said chute cover means and being in spacial alignment with said output chute means, whereby said elongated and flat reciprocating chute cover means is located spacially between said flat input chute bottom portion and said flat output chute top portion and having said apertured portion located to the outside of said spacially aligned chutes when said chute cover is in its set position to ensure against tampering,

b. placing an article in said tamper resistant article storage means by the proprietor of said device,

c. storing a predetermined code into the changeable code setting means by the proprietor of said device,

d. providing a user with the predetermined code for input into the externally located code input means to release an article from the storage device to the externally located access means for subsequent use by the user, and

e. activating of said tamper resistant article release means by the user by input of the predetermined code for releasing the article to the externally located access means from said tamper resistant device.

10. The method of claim **9**, wherein the predetermined code is provided to a communication system for predetermined use, and wherein a user obtains the predetermined code from the communication system.

11. The method of claim **10**, wherein the communication system provided is the 911 emergency telephone system, and wherein the users provided with the predetermined code is selected from a group consisting of firemen, policemen and medical personnel.

4,631,359

ARRANGEMENT FOR SUPPLYING CURRENT TO A SUBSCRIBER TELEPHONE SET

Jan H. Johansson, Bålsta, and Nils J. Sundvall, Lidingö, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

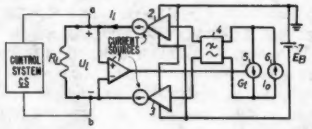
PCT No. PCT/SE83/00333, § 371 Date May 4, 1984, § 102(e) Date May 4, 1984, PCT Pub. No. WO84/01250, PCT Pub. Date Mar. 29, 1984

PCT Filed Sep. 22, 1983, Ser. No. 610,291

Claims priority, application Sweden, Sep. 22, 1982, 8205437

Int. Cl.[4] H04M *19/00*

U.S. Cl. 379—324 **6 Claims**



1. A telephone exchange system apparatus for supplying current to a subscriber telephone set connected via a two-wire line to first and second terminals of the telephone exchange, said apparatus comprising: first and second analog current amplifier means each having a first input, each also having an output connected to one of said terminals for emitting signals, and each further having voltage supply input means; voltage supply means with an output voltage E_B connected to each of said voltage supply input means; means for maintaining the output of said first current amplifier means at a constant potential; and control means connected to said first inputs of each of said current amplifier means for controlling the output current amplitudes thereof.

4,631,360
APPARATUS FOR THE CURRENT SUPPLY OF A SUBSCRIBER SET FROM AN EXCHANGE

Jan H. Johansson, Bålsta, and Nils J. Sundvall, Lidingö, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

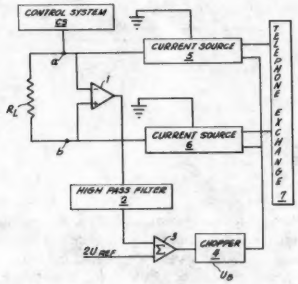
PCT No. PCT/SE83/00329, § 371 Date Apr. 27, 1984, § 102(e) Date Apr. 27, 1984, PCT Pub. No. WO84/01249, PCT Pub. Date Mar. 29, 1984

PCT Filed Sep. 14, 1983, Ser. No. 606,820

Claims priority, application Sweden, Sep. 17, 1982, 8205342

Int. Cl.⁴ H04M *19/00*

U.S. Cl. 379—324 **6 Claims**



1. In a telephone exchange system apparatus for supplying current to a subscriber telephone set connected via a two-wire line to first and second terminals of the telephone exchange, said apparatus comprising first and second current source amplifiers each having an output connected to one of the terminals and each having input means, a DC/DC converter means having a control input and an output means connected to the input means of at least one of said current source amplifiers, means for maintaining the first terminal at a fixed potential, a series circuit means having an input connected across the first and second terminals and an output connected to the control input of said DC/DC converter means, said series circuit means generating a control signal to control said DC/DC converter means to emit a signal from the output means of said DC/DC converter means having a voltage which is a given level above the potential of the second terminal.

4,631,361
PROGRAMMABLE RING GENERATOR

Robert L. Miller, Westerville, Ohio, assignor to ITT Corporation, New York, N.Y.

Filed Jun. 28, 1984, Ser. No. 625,865

Int. Cl.⁴ H04M *3/02, 19/02*

U.S. Cl. 379—351 **18 Claims**

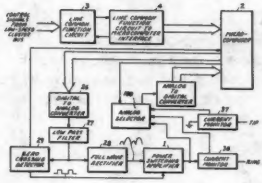
1. A ring generator capable of supplying a plurality of predeterminedly selected distinct voltages each having a predetermined high amplitude and a predetermined frequency to a telephone line comprising:

a programmable computer means having low amplitude versions of said plurality of voltages stored therein in digital form, said computer means being responsive to predetermined control signals to select a desired one of said low amplitude versions of said plurality of voltages stored therein;

first means coupled to said computer means to convert said selected one of said low amplitude versions of said plurality of voltages to an analog version thereof and to increase said analog version to the predetermined high amplitude corresponding thereto prior to coupling to said telephone line;

second means coupled to said first means, said telephone line and said computer means to monitor said selected one of said plurality of voltages coupled from said first means to said telephone line to detect the operating condition of said ring generator and said telephone line; and

an interface means to couple said control signals from control equipment to said computer means and to couple status signals from said computer means to said control equipment, wherein said interface means includes



a serial to parallel converter to couple said control signals from said control equipment to said computer means, and

a parallel to serial converter to couple said status signals from said computer means to said control equipment.

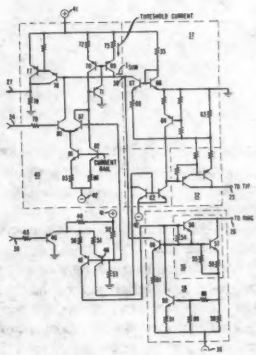
4,631,362
LOW RESISTANCE ORIGINATION SCAN CIRCUIT

Tom D. Arntsen, Boonton, N.J.; Milton L. Embree; Joseph H. Havens, both of Reading, Pa., and Rouben Toumani, Randolph, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 27, 1984, Ser. No. 655,372

Int. Cl.⁴ H04M *3/22*

U.S. Cl. 379—384 **15 Claims**



1. An origination scan circuit for monitoring a telephone subscriber loop circuit state to detect a subscriber off-hook condition and comprising

tip and ring termainals for making connection to a subscriber loop circuit,

first and second resistance means connected in series between said tip and ring terminals, respectively, and connections for a supply voltage,

means for sensing current level in each of said resistance means,

means, responsive to an output of said sensing means, for producing and indicating signal upon the occurrence in at least one of said tip and ring terminals and its associated resistance means of current in excess of condition,

means for switchably connecting said first and second resistance means to respective ones of said tip and ring connections, and

means, responsive to said indicating signal representing detection of loop current in excess of said predetermined level, for actuating said switchably connecting means to disconnect said first and second resistance means from said tip and ring connection terminals.

4,631,363

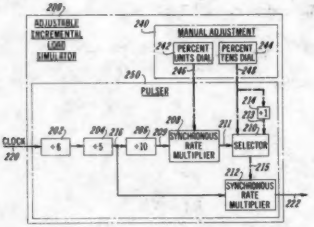
METHOD AND APPARATUS FOR INCREMENTAL LOAD SIMULATION

Robert W. Foster, Glen Ellyn, and Max D. Weekly, Big Rock, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 269,265, Jun. 1, 1981, abandoned. This application Nov. 14, 1985, Ser. No. 798,137

Int. Cl.⁴ H04Q *11/00*

U.S. Cl. 379—15 **19 Claims**



1. In a digital processing, telecommunication, or telephone control system, apparatus for simulating an overload state and testing the performance of the system in the simulated overload state, comprising:

control means responsive to requests for service for executing system tasks; and

manually controllable interrupt signal generating means for generating interrupt signals at a manually adjustable rate;

said control means responsive to said interrupt signals for simulating an overload state by preventing the execution of system tasks for a percentage of time directly proportional to the rate of said interrupt signals;

said control means comprising clock means and operative under program control for testing system performance by measuring the time required by said system to respond to requests for service.

4,631,364

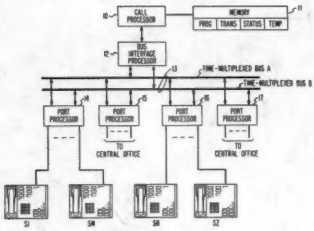
COMMUNICATION SYSTEM HAVING DYNAMICALLY ASSIGNED STATION SET BUTTONS

Joan H. Coyne, Holmdel; David J. Dooling, Fair Haven; Louis E. Miller, Howell, all of N.J., and Robert D. Nalbone, Boulder, Colo., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed Feb. 23, 1984, Ser. No. 582,850

Int. Cl.⁴ H04M *3/42, 3/545*

U.S. Cl. 379—164 **14 Claims**



1. A communication system including a common control and a station having a capability of receiving a call over a shared facility and a call over a dedicated facility, said station comprising a call appearance button for initiating at said station a first type of call selected from a group of call types including a shared facility call and a dedicated facility call, said common control comprising

means responsive to a received call of said group of call types to said station for dynamically assigning said received call to said call appearance button at said station.

4,631,365

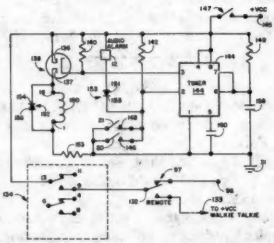
INTERCOM SYSTEM

Clinton Potter, 1012 Aloha Dr., Encinitas, Calif. 92024, and Robert Hasty, 1882 Burton St., San Diego, Calif. 92111

Filed Sep. 24, 1984, Ser. No. 653,284

Int. Cl.⁴ H04M *9/00*

U.S. Cl. 379—167 **2 Claims**



1. An intercom system for communicating between persons through a structure having an interior and exterior side comprising:

a first transceiver located on the exterior of said structure;

a second transceiver located on the interior side of said structure and remote therefrom;

an external source of voltage for operating said first transceiver means;

a timing means interconnected between said external source of voltage and said first transceiver means for providing said voltage to said first transceiver means for a set time period when activated;

an activating means manually initiated by a person positioned on said exterior side of said structure for starting

the operation of said timing means to activate said first transceiver means;

an audio alarm energized momentarily by the activating means when said timing means is activated, whereby when the activating means initiates power to said first transceiver means by activating said timing means and sounds said audio alarm a person on said interior side of said structure remote therefrom is alerted to turn on the power to said second transceiver to initiate a conversation via said transceivers.

4,631,366

BATTERY FEED CIRCUIT FOR SUBSCRIBER LINE

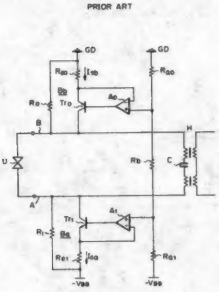
Kenji Takato, Kawasaki; Mitsutoshi Ayano, Tokyo; Kiyoshi Shibuya; Yoshimi Iijima, both of Kawasaki, and Atsuo Serikawa, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 21, 1985, Ser. No. 736,345

Claims priority, application Japan, May 26, 1984, 59-105660; Jun. 14, 1984, 59-120668

Int. Cl.[4] H04M *19/00*

U.S. Cl. 340—333 **14 Claims**



1. A battery feed circuit for feeding constant currents from a power source with a power source level to a first subscriber line and a second subscriber line having voltages thereon, comprising:

first and second feed circuit parts operatively connected to the first and second subscriber lines, respectively;

first and second reference voltage output circuits, operatively connected to said first and second feed circuit parts and the power source, for producing first and second reference voltages by dividing the ground level and the power source level and for applying the first and second reference voltages to said first and second feed circuit parts, respectively; and

an intermediate voltage output circuit, operatively connected to said first and second feed circuit parts and said first and second reference voltage output circuits, for producing an intermediate voltage between the voltages on the first and second subscriber lines and for supplying the intermediate voltage to each of said first and second reference voltage output circuits simultaneously.

4,631,367

MULTI-LINE TELEPHONE SYSTEM

Frank Coviello, Peekskill, and Michael Antico, Northport, both of N.Y., assignors to Lantel International Corp., Export, Pa.

Filed Aug. 29, 1984, Ser. No. 645,450

Int. Cl.[4] H04Q *5/20*

U.S. Cl. 379—157 **21 Claims**

1. A multi-line telephone system comprising:

a plurality of telephone station sets operably connected together;

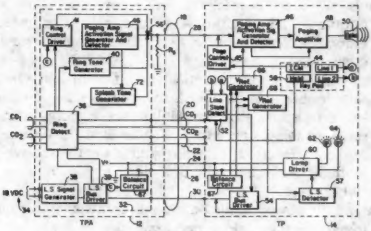
at least one of said station sets being adapted to interface with telephone CO lines;

at least one of said station sets being adapted to interface with a common power source;

a bus means operably connecting said station sets together in bussed loop fashion;

said bus means including at least one status signal conductor for providing CO line status information to said station sets;

each said station set having drive circuit means for impressing variable value CO line status signals on said one status signal conductor in accordance with the line status imparted by the respective said station set, and detector



circuit means for detecting the varying values of such a line status signal;

reference voltage generating means located in each said station set and independently operable from such a common power source to generate in each said station set reference voltages for comparison with such a line status signal by said detector circuit means to determine CO line status; and

each said station set further including indicator means which are operable in response to the line status signal detected by the said detector circuit means of the respective said station sets to inform users of said respective station sets of CO line status.

4,631,368

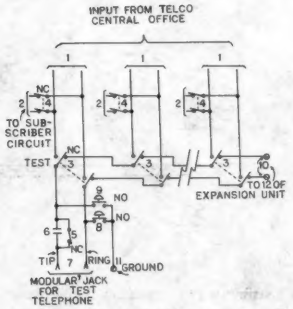
SWITCHING SYSTEM FOR READILY ACCESSING THE SERVICE LINE FOR TEST BASIC UNIT AND THE SWITCHING SYSTEM FOR READILY ACCESSING THE SERVICE LINE FOR TEST EXPANSION UNIT

Alfred E. Fisler, 25872 John Rd., Olmsted Falls, Ohio 44138

Filed Aug. 20, 1984, Ser. No. 642,408

Int. Cl.[4] N04B *3/46*

U.S. Cl. 379—29 **2 Claims**



1. An electromechanical switching arrangement equipped for testing a plurality of two-wire telephone circuits existing between a plural number of subscriber stations and a plural

number of telephone company two-wire lines to a central office, the arrangement comprising:

an individual double pole single throw, normally closed switch connected at the subscriber premises in series between each of said plurality of two-wire telephone circuits,

an individual double pole double throw switch with each normally open contact of each switch connected to one or the other line of a respective one of said two-wire lines of said plural number of telephone company two-wire lines,

an individual normally closed contact of each double pole double throw switch connected to an individual switch arm terminal of a next adjacent of said double pole double throw switches,

each individual normally closed contact of a last of said double pole double throw switches being connected to an individual terminal of a two terminal means for further connection,

individual switch arm terminals of a first of said adjacent of said double pole double throw switches being connected to two terminals of a modular jack for connection to a standard telephone which is to be used for testing,

a capacitor inserted in series with a tip line between said modular jack and said first double pole double throw switch,

a normally closed single pole single throw switch connected in parallel with said capacitor, and

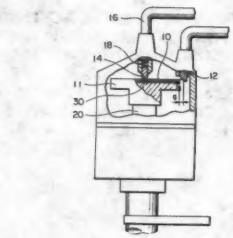
a respective normal open switch connected in series between each said line between the modular jack and said first double pole double throw switch, and a system ground circuit.

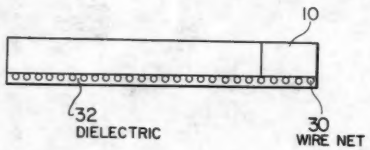
4,631,369

DISTRIBUTOR FOR AN INTERNAL COMBUSTION ENGINE

Yutaka Ohashi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1985, Ser. No. 774,731
Claims priority, application Japan, Sep. 21, 1984, 59-199033
Int. Cl.[4] H01H *1/00, 19/00*
U.S. Cl. 200—19 R **9 Claims**





1. In a distributor for suppressing radio frequency interference in the ignition system of an internal combustion engine having a rotor rotated by said engine, the improvement comprising:

a rotor electrode carried by said rotor, said electrode including a plate having a bottom surface facing said rotor and a top surface, and a dielectric material adhered to one of said surfaces of said plate;

a plurality of lateral terminal electrodes disposed in the rotating locus of said rotor and separated from said rotor electrode by a discharge gap;

a contact electrode contacting said rotor electrode for supplying a high voltage to said rotor electrode; and

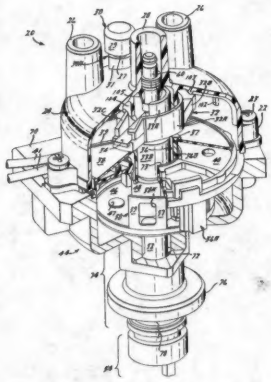
a wire net disposed on said dielectric material, said dielectric material being present in the openings of said wire net and bonding said wire net to said one surface of said plate.

4,631,370

LABYRINTH FOR AN IGNITION DISTRIBUTOR CAP AND ROTOR ASSEMBLY WITH ATMOSPHERIC PURGING ACTION

Leonard J. Kronberger, Oak Park, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 1, 1985, Ser. No. 782,758
Int. Cl.[4] H01H *19/00*
U.S. Cl. 200—19 R **6 Claims**



5. An ignition distributor to work with spark plug electrodes, a rotor electrode, a coil electrode and a shaft for an internal combustion engine with cylinders, the ignition distributor comprising:

a bowl shaped housing;

a distributor cap comprising:

a generally dome shape with a generally hollow interior and with a circular shaped bottom to mate with the bowl shaped housing;

spark towers equal in number to the number of cylinders of the internal combustion engine, projecting up from the top of the dome shape and slotted to accept spark plug electrodes and allow them to protrude into the distributor cap interior for communication with the rotor electrode;

a vent tower projecting up from the top of the dome shape and provided with a vent port through to the distributor cap interior to allow for the outward flow of the atmosphere inside the distributor cap and bowl shaped housing;

a coil tower projecting up from the top of the dome shape and slotted to accept a coil electrode and allow it to protrude into the distributor cap interior for communication with the rotor electrode;

an inner labyrinth of annular shape on the interior surface of the dome shape surround the coil electrode and protruding into the hollow interior of the dome shape; and

an outer labyrinth of annular shape on the interior surface

of the dome shape surrounding the inner labyrinth thereby forming an annular channel; and

a rotor comprising:

a cylindrical member having an upper and lower portion, each portion having a bore;

a platform integrally formed to the cylindrical member for supporting a rotor electrode perpendicular to and surrounding the cylindrical member dividing the cylindrical member into an upper portion and a lower portion;

rotor electrode mounting means on the platform for securing the rotor electrode to the platform;

a rotor ring surrounding the upper portion of the cylindrical member thereby forming an annular channel; and

the rotor ring and upper portion of the cylindrical member having a slot interrupting the annular channel to accept the rotor electrode which allows communication between the rotor electrode and the coil electrode and further allows communication between the rotor electrode and the spark plug electrodes as the rotor rotates about the shaft;

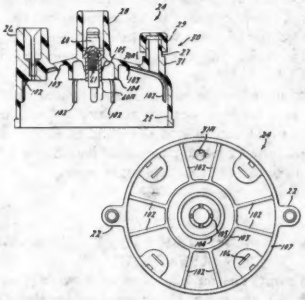
the rotor ring and upper portion of the cylindrical member inter-nested with the inner and outer labyrinths of the distributor cap in combination providing a labyrinth for increased cylinder-to-cylinder misfire resistance.

4,631,371

WET SURFACE TRACKING RESISTANCE FOR AN IGNITION DISTRIBUTOR CAP

Leonard J. Kronberger, Oak Park, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 1, 1985, Ser. No. 782,759
Int. Cl.[4] H01H *19/00*; F02P *1/00*
U.S. Cl. 200—19 DC **1 Claim**



1. An ignition distributor cap to work with a rotor, the rotor having a cylindrical member having an upper and lower portion, each portion having a bore where a rotor ring surrounds the upper portion of the cylindrical member thereby forming an annular channel, spark plug electrodes, a coil electrode, a shaft, a bowl shaped housing and a rotor electrode in an ignition distributor for an internal combustion engine with cylinders, the ignition distributor cap comprising:

a generally domed shape with a generally hollow interior and with a circular shaped bottom to mate with the bowl shaped housing;

spark towers equal in number to the number of cylinders of the internal combustion engine, projecting up from the top of the dome shape and slotted to accept spark plug electrodes and allow them to protrude into the distributor cap interior for communication with the rotor electrode;

a vent tower projecting up from the top of the dome shape and provided with a vent port through to the distributor cap interior to allow for the outward flow of the atmosphere inside the distributor cap and bowl shaped housing;

a coil tower projecting up from the top of the dome shape and slotted to accept a coil electrode and allow it to protrude into the distributor cap interior for communication with the rotor electrode;

interruption ribs which radially follow the dome shape, protruding into the hollow interior of the dome shape;

a rib ring of annular shape which surrounds the coil electrode protruding into the hollow interior of the dome shape and intersecting with and providing a termination for each of the interruption ribs thereby providing spark isolation and increased wet surface tracking resistance by urging the spark to follow the less resistance path provided by the rotor electrode and the spark plug electrodes;

an inner labyrinth of annular shape on the interior surface of the dome shape surrounding the coil electrode and protruding into the hollow interior of the dome shape; and

an outer labyrinth of annular shape on the interior surface of the dome shape surrounding the inner labyrinth thereby forming an annular channel;

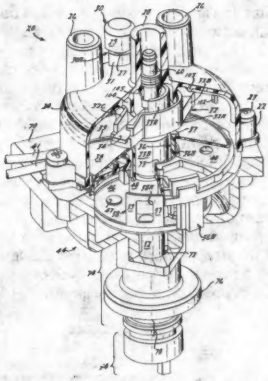
the inner and outer labyrinths of the distributor cap for use in combination and inter-nesting with the rotor ring and upper portion of the cylindrical member to provide a labyrinth for increased cylinder-to-cylinder misfire resistance.

4,631,372

PLASTIC HUB AND INTERRUPTER ASSEMBLY FOR AN IGNITION DISTRIBUTOR

Leonard J. Kronberger, Oak Park, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 1, 1985, Ser. No. 782,761
Int. Cl.[4] F02P *1/00*; H01H *19/00*
U.S. Cl. 200—19 R **5 Claims**



1. For an internal combustion engine with cylinders, an ignition distributor comprising:

distributor cap;

a rotor;

spark plug electrodes;

a coil electrode;

a shaft;

a bowl shaped housing with a bearing surface;

a switch plate assembly;

an interrupter and hub assembly;

and a rotor electrode;

the interrupter and hub assembly, being mounted onto the shaft such that rotation of the shaft results in rotation of the interrupter and hub assembly, rotates directly on the bearing surface of the bowl shaped housing.

4,631,373

PUSH-BUTTON SWITCH LOCKING DEVICE FOR USE IN ELECTRIC APPLIANCE

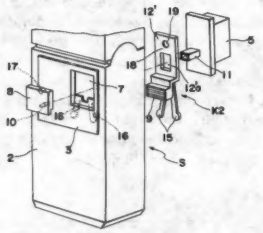
Masahiko Ochiai, Nogata, Japan, assignor to Kyushu Hitachi Maxell, Ltd., Fukuoka, Japan

Division of Ser. No. 475,156, Mar. 14, 1983, Pat. No. 4,504,707. This application Dec. 18, 1984, Ser. No. 693,271

Claims priority, application Japan, Mar. 15, 1982, 57-36698[U]; May 17, 1982, 57-72843[U]; Jul. 8, 1982, 57-104664[U]; Jul. 8, 1982, 57-104666[U]

Int. Cl.⁴ H01H *3/20*

U.S. Cl. 200—43.17 **5 Claims**



1. A push-button switch locking device for use in an electric appliance, comprising: a casing; a push-button mounted on a portion of the outer surface of said casing; a switch provided in said casing, said switch being connected to said push-button so as to be actuated upon depression of said push-button such that said push-button and said switch constitute a push-button switch; a sliding knob which is slidably mounted on the outer surface of said casing so as to be slid between a locking position of said push-button and an unlocking position of said push-button in a direction at right angles to the direction of depression of said push-button, said sliding knob being connected with a locking piece having a hole therein; and a projection mounted on said push-button for cooperating with said hole in said locking piece for preventing depression of said push-button when said sliding knob is in said locking position and for allowing depression of said push-button when said sliding knob is in said unlocking position, said sliding knob being integrally formed with said locking piece through a stepped portion such that upon actuation of the sliding knob perpendicular to the depression of said push-button, the locking piece cooperates with said projection thereby preventing the actuation of the switch by preventing depression of the push-button and at the same time the stepped portion engages the lower end portion of the push-button to support said push-button and positively prevent the depression of the push-button at its locked position.

4,631,374

DIAPHRAGM OPERATED SWITCH TYPE BIN LEVEL SENSOR

Richard S. Zoludow, South Bend, Ind., assignor to Dwyer Instruments, Inc., Michigan City, Ind.

Filed Dec. 6, 1985, Ser. No. 805,780

Int. Cl.⁴ B67D *5/08*; H01H *35/34*

U.S. Cl. 200—61.21 **8 Claims**

1. A bin level sensor device, said device comprising:

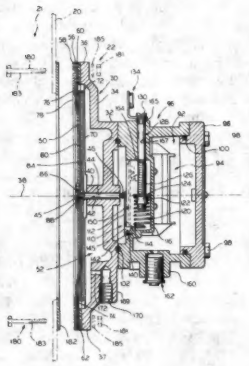
a housing member that is recessed on one side of same to define a diaphragm chamber, having a central cross wall structure defining a passage thereacross that is located in alignment with the center of said diaphragm chamber and defines the central axis of said device,

a shaft shiftably mounted in said passage in close fitting relation thereto and having its opposed ends projecting therefrom, with one of said shaft ends being disposed in said diaphragm chamber,

a diaphragm mounted across said diaphragm chamber and having a perimeter that is fixed in sealed relation to said housing,

a diaphragm plate interposed between said diaphragm and said one end of said shaft within said chamber in centered relation to said diaphragm, and said shaft and being disposed on one side of said diaphragm,

said diaphragm plate being seated against said shaft one end, with the other side of said diaphragm being exposed about said axis a predetermined amount for actuation inwardly of said diaphragm chamber under pressure of particulate material of a bin,



said device including means for fulcruming said diaphragm plate at a predetermined location of the housing member on the margin of same when said diaphragm is deflected against said diaphragm plate on the opposite side of said axis,

and including off-on switch means mounted on the other side of said housing member actuated by said shaft adjacent the other end of said shaft and including means for adjustably spring biasing said shaft lengthwise of said axis in the direction of said diaphragm plate.

4,631,375

DELAYED ACTION LIQUID LEVEL SENSING APPARATUS

Gerald McCann, Valencia, Calif., assignor to McCann's Engineering & Manufacturing Company, Los Angeles, Calif.

Filed Dec. 5, 1984, Ser. No. 678,270

Int. Cl.⁴ H01H *35/18*

U.S. Cl. 200—84 C **7 Claims**

1. In a liquid level float controlled switch apparatus having a housing within which electrical components are present in a fluid-tight medium, and a probe section integral with and suspended from said housing; the improvements comprising, in combination:

a float means disposed about said probe section for traversing said probe section in a vertical plane,

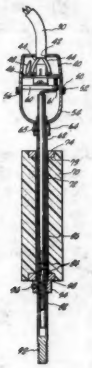
a first magnet integral with said float means and positioned in a lower portion of said float means,

a magnetically operated switch means located within said probe section and having oppositely facing magnetic elements adapted to contact one another in response to the presence of a magnetic field occasioned by the position of said first magnet relative to said magnetic elements,

a lower magnet spaced apart on the same axis from said magnetic switch means, said lower magnet slidably engaged with the exterior of said probe section;

a second magnet integral with said float means and positioned in an upper portion of said float means in a verti-

cally spaced apart relationship with respect to said first magnet;



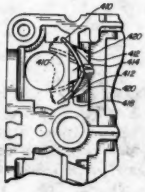
an upper magnet located along said probe section at the uppermost portion thereof.

4,631,376

MOLDED CASE CIRCUIT BREAKER WITH AN IMPROVED ARC GAS EXTERNAL VENTING SYSTEM

David A. Leone, Aliquippa, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 28, 1984, Ser. No. 655,956
Int. Cl.[4] H02B *1/08*
U.S. Cl. 200—306 3 Claims



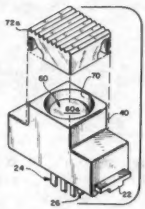
1. An electrical circuit breaker comprising:
a first electrical contact,
a second electrical contact,
operating means for moving said first and said second electrical contacts into engagement and out of engagement,
a molded case for housing the internal components of said circuit breaker,
pressure responsive venting means for controllably venting gaseous arc products from the interior of said molded case to the exterior thereof and for minimizing the ingress of environmental contaminants, said venting means comprising a pair of side by side vent slots extending through said case and, said vent slots being defined by sidewalls integrally formed in said case and being separated from each other by a barrier, and one way valve means comprising an elongated resilient member elastically bent around said barrier and having portions on opposite sides of barrier inserted in the respective slots to form a one-way valve in each of said slots.

4,631,377

SLIDE SWITCH WITH INDICATOR LIGHT

Kazuyoshi Imazeki, and Nobuaki Yokoyama, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

Filed Feb. 21, 1985, Ser. No. 703,819
Int. Cl.[4] H01H *9/02, 9/16*
U.S. Cl. 200—314 10 Claims



1. A slide switch comprising: a plurality of sets of aligned terminals, each said set comprising at least a center terminal and two end terminals, one to either side of said center terminal and aligned along a common axis therewith; a plurality of elongate slide means for slidably engaging predetermined ones of said terminals and respectively associated with said plurality of sets of terminals, said slide means being of sufficient length to engage said center terminal and only one of the associated end terminals; actuator means including means for mounting said slide means for movement in unison with said actuator means between a first position wherein said slide means electrically couple each of said center terminals with one of its associated end terminals and a second position wherein said slide means electrically couple each of said center terminals with ther other of its associated end terminals; light emitting means having a pair of electrodes and responsive to a given voltage across said electrodes for emitting light; said actuator means further including an actuator body having a recess for mounting said light emitting means therein for observing the presence or absence of light therefrom during operation of said slide switch; and guide means for guiding said pair of electrodes into position for electrically conductive contact with selected ones of said plurality of slide means; wherein said terminals comprise generally flat, rectilinear upstanding members, wherein said slide means comprise elongate members which are generally U-shaped in cross-section for complementary slideable, wiping engagement over protruding end portions of said terminals, and further including tubular socket members located on external side surfaces of ones of said elongate U-shaped members comprising said selected ones of said plurality of slide means for egaging said electrodes.

4,631,378

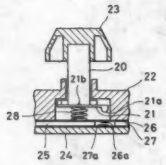
PUSH BUTTON SWITCH

Shigeru Nobesawa, Sagamihara, Japan, assignor to Jelco. Co., Ltd., Japan

Filed Oct. 19, 1984, Ser. No. 662,686
Claims priority, application Japan, Oct. 31, 1983, 58-168619[U]
Int. Cl.[4] H01H *3/12*
U.S. Cl. 200—340 7 Claims

1. A push button switch comprising an integral homogeneous one piece molded plastic key stem and cantilever portion, said key stem having a longitudinal axis, means for mounting said key stem for sliding movement relative to a switch mounting frame generally parallel to said longitudinal axis, a contact positioned so as to be closed upon movement of said key stem in a first direction, said integrally molded cantilever portion lying generally in a plane transverse to said longitudinal axis, said cantilever portion being at least in partial surrounding and partial circumferentially spaced relationship to said key stem,

said cantilever portion being relatively thin and resilient in said first direction and in an opposite second direction, said cantilever portion carrying oppositely directed projections, a first of said projections being operative for closing said contact upon movement of said key stem in said first direction, a second of



said projections being operative for contacting said switch frame upon movement of said key stem in said second direction, said cantilever portion resilience and the projecting thereof effecting damping of said stem upon return movement toward said switch mounting frame, and a coil spring for moving said key stem in said second direction.

4,631,379

HIGH-FREQUENCY HEATING DEVICE HAVING ROTATABLE TRAY AND HIGH FREQUENCY WAVE AGITATOR

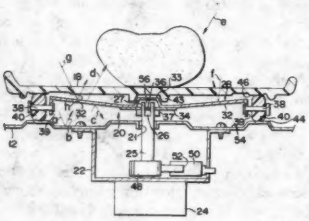
Shuki Aoyama, Aichi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 16, 1985, Ser. No. 723,899

Claims priority, application Japan, Apr. 20, 1984, 59-79383; Apr. 20, 1984, 59-79384; Sep. 7, 1984, 59-187574; Sep. 7, 1984, 59-197578; Sep. 7, 1984, 59-135950

Int. Cl.[4] H05B 6/78

U.S. Cl. 269—10.55 F **14 Claims**



1. A high-frequency heating device comprising:

a heating chamber;

high-frequency oscillating means for irradiating high-frequency waves into the heating chamber;

a rotatable tray disposed in the heating chamber and adapted to receive thereon an object to be heated, said rotatable tray being made of a material permeable to electric waves and having a guide portion formed at a central portion of its lower surface;

torque transmitting means, disposed between the rotatable tray and the bottom of the heating chamber, for transmitting torque to the rotatable tray, said torque transmitting means including a roller holder having an engaging portion and a plurality of roller supporting arms which extend radially from the engaging portion and are slanted upward toward the rotatable tray to reflect waves passed through the rotatable tray toward the object on the rotatable tray, and a plurality of rollers rotatably supported on the extended end of the corresponding roller supporting arms and adapted to roll on the bottom of the heating chamber, said rotatable tray being placed on the rollers; and

driving means for rotating the roller holder, said engaging portion of the roller holder detachably coupled to the driving means to thereby facilitate cleaning of underlying surfaces, and being engaged with the guide portion of the rotatable tray to position the rotatable tray relative to the roller holder.

4,631,380

SYSTEM FOR THE MICROWAVE TREATMENT OF MATERIALS

Van N. Tran, Marshall, Australia, assignor to Durac Limited, Australia

Filed Aug. 23, 1984, Ser. No. 643,810

Claims priority, application Australia, Aug. 23, 1983, PG 0992

Int. Cl.[4] H05B 6/72

U.S. Cl. 219—10.55 A **17 Claims**

1. A system for the microwave treatment of materials, comprising a treatment zone including means to confine the material to be treated in at least a partly cylindrical form, radiation means spaced from and outside said treatment zone for directing microwave radiation into said zone along at least three different axes of radiation, said radiation means being arranged in spaced relation around said zone, said axes of radiation being in spaced relation to each other at the radiation means, means for reflecting the microwave radiation directed along each axis back into said treatment zone after it passes through said zone, said microwave radiation being non-coherent, said at least partly cylindrical confinement of said material to be treated serving to focus said microwave radiation on the material contained in said treatment zone.

4,631,381

MAGNETIC YOKE INDUCTOR FOR GLASS FIBER MANUFACTURING EQUIPMENT

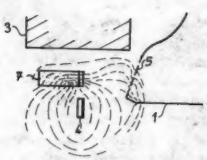
Daniel Delage, Grieres, and Jean Reboux, Savigny sur Orge, both of France, assignors to Saphymo Stel, Massy, France

Filed Jul. 29, 1985, Ser. No. 760,308

Claims priority, application France, Aug. 3, 1984, 84 12335

Int. Cl.[4] H05B 6/40

U.S. Cl. 219—10.57 **10 Claims**



1. A glass fiber manufacturing equipment comprising a centrifuge, a main gas heating device and a complementary induction heating device with an annular inductor (4) and a separate magnetic induction flow element (7) adapted to direct at least part of leakage flow towards the centrifuge of said equipment, said element having low energy dissipating characteristics at the frequency of the current supplied to said inductor.

4,631,382

BED FOR ELECTRICAL DISCHARGE MACHINING APPARATUS

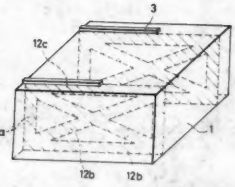
Tokio Fukunaga; Takuji Magara; Shigekazu Sakabe, all of Hyogo; Jun Aramaki, Aichi; Toshiharu Karashima, Aichi, and Minoru Ushida, Aichi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1984, Ser. No. 651,568

Claims priority, application Japan, Sep. 19, 1983, 58-172514; Sep. 19, 1983, 58-172515; Sep. 19, 1983, 58-172517

Int. Cl.[4] B23H *1/00, 7/32;* A47B *7/02*

U.S. Cl. 219—69 R 14 Claims



9. An electric discharge machining apparatus, comprising: a bed constituted by a pair of opposed side plates and an upper plate, a machining head supported above said bed by a column, a pair of saddle guide rails disposed on said upper plate, a saddle for supporting a workpiece movably mounted on said saddle guide rails, and reinforcing members provided under said upper plate and extending parallel to and directly under respective ones of said saddle guide rails, said reinforcing members extending vertically from said upper plate to a supporting surface of said bed, and each including at least one plate like member extending vertically from said upper plate to said supporting surface.

4,631,383

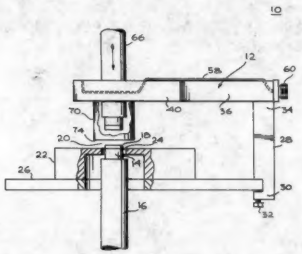
MACHINE WITH AUTOMATIC FINGER SAFETY GUARD

Irving C. Haggett, Canterbury, Conn., assignor to Yardney Corporation, Pawcatuck, Conn.

Filed Sep. 27, 1985, Ser. No. 780,761

Int. Cl.[4] B23K *11/00*

U.S. Cl. 219—78.01 4 Claims



1. An improved resistance welding machine with automatic finger safety guard, said machine comprising, in combination:

a. a resistance welding machine body defining a finger-accessible work space defined between a pair of welding electrodes with at least one of said electrodes being vertically disposed and movable in said work space; and,

b. an electric motor connected by leads to a power source and to said movable electrode for powering said movable electrode; and,

c. an automatic finger safety guard secured to said machine body and comprising:

i. a finger-movable enclosure comprising a hollow tubular body vertically disposed around said movable electrode, the upper end of said hollow tubular body including an outwardly extending flange, and said guard including a bracket upon which said flange is disposed and from which said hollow tubular body depends; and,

ii. switch means connected to said hollow tubular body and to said electric motor leads for automatically interrupting said powering of said movable electrode upon movement of said enclosure.

4,631,384

BITUMEN COMBUSTION PROCESS

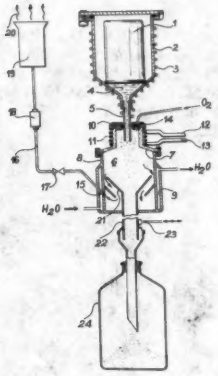
Aymé Cornu, Meylan, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 13, 1984, Ser. No. 579,813

Claims priority, application France, Feb. 17, 1983, 83 02581

Int. Cl.[4] B23K *9/00;* C07C *27/10*

U.S. Cl. 219—121 P 4 Claims



1. A process for the combustion of bitumen, wherein the bitumen is softened by preheating and is then introduced into a combustion chamber, traversed by an amount of oxygen and subjected to ionization by an intense ultra-high frequency field, said amount of oxygen being in excess of the quantity of oxygen necessary for combustion of the bitumen, so as to raise the surface of the bitumen to a temperature above 1000° C., thereby ensuring its vaporization and rapid combustion in the thus produced oxygen plasma.

4,631,385

AUTOMATED POSITION DETECTORS AND WELDING SYSTEM UTILIZING SAME

Ronald R. Rothermel, Pollock Pines, Calif., assignor to Dimetrics, Inc., Diamond Springs, Calif.

Filed Mar. 29, 1985, Ser. No. 717,357

Int. Cl.[4] B23K *9/12*

U.S. Cl. 219—124.03 39 Claims

16. A welding system comprising:

a supply of consumable electrode metal;

means for directing said consumable electrode metal from said supply through contact means in a welding torch means to a workpiece;

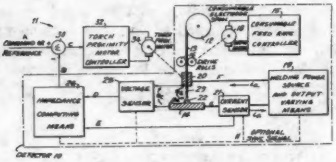
means for providing electrical power to establish an arc between the consumable electrode metal and workpiece;

means for varying the electrical power supplied to the arc;

means for detecting impedance related information due to

the effect of the electrical power variation on at least one of arc voltage or arc current;

means for processing the detected impedance related information so as to produce contact means to workpiece distance related information; and



GENERALIZED TORCH PROXIMITY/WELDMENT GEOMETRY DETECTOR AND TORCH PROXIMITY CONTROLLER

means operatively associated with the processing means for controlling the relative distance between the contact means and workpiece.

4,631,386

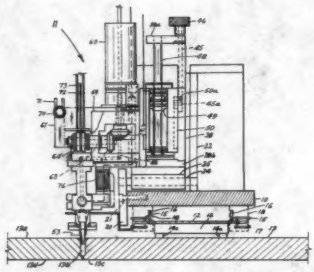
WELDING HEAD APPARATUS

Clyde M. Slavens, Evans Automatic Welding Systems, Inc. P.O. Box 440,577, Houston, Tex. 77244

Filed May 14, 1984, Ser. No. 610,316

Int. Cl.[4] B23K *9/12, 37/02*

U.S. Cl. 219—125.12 **17 Claims**



1. Welding head apparatus, comprising welding head body means, a welding tip having a shaft connected transversely thereof, a circular opening in said body means having a slot leading therefrom to a side of said body means, said circular opening having said shaft disposed therein, a screw across said slot for tightening said circular opening about said shaft, said shaft and welding tip being rotatably adjustable when said screw is loosened so that the angle of said tip with respect to a workpiece may be adjusted, passage means through said body means for delivering a gas to said welding tip, drive roller and idler roller means within said body means for delivering welding wire through said welding tip, and means for supplying welding current to said welding wire within said welding tip.

4,631,387

AROMA GENERATING APPARATUS WITH ELECTRICAL HEATING ELEMENT

Dov Z. Glucksman, Brookline, Mass., assignor to Environmental Fragrance Technologies, Ltd., New York, N.Y.

Filed Aug. 2, 1985, Ser. No. 761,944

Int. Cl.[4] H05B *3/20;* **A61L** *9/03*

U.S. Cl. 219—272 **18 Claims**

1. An aroma generating apparatus comprising:

a housing with openings for allowing an air current to pass therethrough;

a medium impregnated with aroma producing fluid and removably supported by said housing at least partially within said air current; and

electrical heating means adapted for coupling to an external power source and supported by said housing proximate said medium when said medium is supported by said housing, said electrical heating means comprising:

a heating element disposed between substantially parallel and spaced apart electrical insulating layers, said heating element comprising at least a pair of terminals electrically extended through at least one of said insulating layers; and

a frame which clamps said insulating layers along a perimeter region thereof against said heating element and which cooperates with said at least one of said insulating layers

to form a compartment surrounding said electrically extended terminals, said frame comprising:

first and second sections, said first section further comprising a peripheral wall member and a flange extending inwardly therefrom for engagement with the periphery of one of said insulating layers; and

said second section includes an outer peripheral wall member adapted for mating engagement with said first section peripheral wall member whose sides are shorter than said outer peripheral wall member, said inner peripheral wall member adapted to engage one of said insulating layers whereby said insulating layers and intermediate heating element are pressed together when said first and second sections are joined together, said inner peripheral wall member having at least one side spaced apart from an associated side of said outer wall member to form said compartment.

4,631,388

OFF-PEAK ELECTRIC LIQUID HEATING SYSTEM EMPLOYING REGULATABLE HEAT PIPE

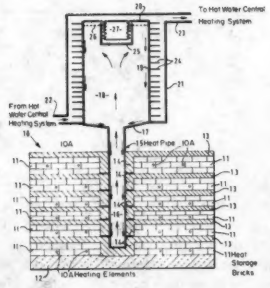
Howard J. Manning, Cambridge, England, assignor to TI Domestic Appliances Limited, London, England

Filed Nov. 7, 1984, Ser. No. 668,948

Claims priority, application United Kingdom, Nov. 8, 1983, 8329740

Int. Cl.[4] F24H *7/00;* **H05B** *1/00;* **F28D** *15/02*

U.S. Cl. 219—326 **12 Claims**



1. In a liquid heating system for heating a first liquid, said system including a heat store to be heated to a relatively high temperature by off-peak electricity, and said heat store being

thermally connected to a vessel containing the first liquid to be heated to a temperature lower than said relatively high temperature, wherein the improvement comprises a controllable heat pipe providing said thermal connection, the heat pipe including an evaporator zone in thermal contact with the heat store and a condenser zone in thermal contact with the vessel, the zones joined by at least one duct, the evaporator zone, condenser zone and the at least one duct being hermetically sealed and containing a predetermined quantity of a volatile second liquid, arranged so that after the second liquid is evaporated in the evaporator zone, it passes through said at least one duct to the condenser zone where it is condensed, and from whence the second liquid returns to the evaporator zone through said at least one duct, the quantity of second liquid being chosen to be sufficiently small so that, in use, the rate of heat transfer from the evaporator zone to the condenser zone is determined by the rate of return flow of the second liquid towards the evaporator zone rather than the rate of flow of the evaporated second liquid towards the condenser zone, or the rate of heat transfer to the evaporator zone or from the condenser zone, and control means being provided directly responsive to the pressure of the evaporated second liquid in said condenser zone for controlling the rate of return flow of the second liquid to the evaporator zone.

4,631,389

ELECTRICALLY OPERATED HEATING ELEMENT FOR A HOT-RUNNER TOOL

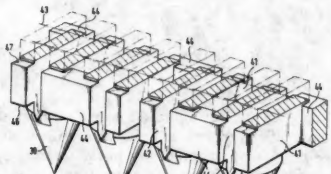
Walter Muller, Battenberg, Fed. Rep. of Germany, assignor to Ewikon Entwicklung und Konstruktion GmbH & Co.KG, Herford, Fed. Rep. of Germany

Filed Sep. 24, 1984, Ser. No. 653,990

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1983, 3425518; Sep. 29, 1983, 3335296; Sep. 29, 1983, 3335294

Int. Cl.[4] F27B *14/06*

U.S. Cl. 219—421 **6 Claims**



1. In a hot-runner tool that has an electrical resistance heated heat conductor and is positioned in a hot runner and in runners that derive from the heat conductor and lead to a series of outflow channels from the hot-runner tool, the improvement wherein the heat conductor comprises a flat body with tongues on a side toward the outflow channels, each tongue extending to the vicinity of one outflow channel wherein the heat conductor has a longitudinal midplane and further comprising a plurality of hot rods each having two separated jaws displaced with respect to the longitudinal midplane of the heat conductor, with each adjacent bridging web positioned on opposite sides of the midplane.

4,631,390

THERMAL LIMITER

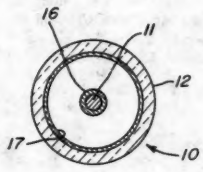
Peter W. Crossley, Havant; Bernard F. Fellerman, Hayling Island, and Graham H. Goodchild, Portchester, all of England, assignors to THORN EMI Domestic Appliances Limited, London, England

Filed Oct. 15, 1984, Ser. No. 661,295

Claims priority, application United Kingdom, Dec. 1, 1983, 8332087; Jan. 24, 1984, 8401799

Int. Cl.[4] H05B *3/72*

U.S. Cl. 219—449 **7 Claims**



1. A thermal limiting device for controlling energization of at least one source of infra-red radiation mounted in heating apparatus, said device comprising:

a tubular member having an annular wall formed from a material transmissive of infra-red radiation of a first wavelength and absorptive of infra-red radiation of a second wavelength, said wall defining an inner surface of said member,

a wire member accommodated within said tubular member and formed from a material of higher thermal expansion than said material of said tubular member,

switching means, for de-energising said at least one source,

means securing said wire member, said tubular member and said switching means relative to each other, such that said switching means is operable by thermal expansion of said wire member, and

a coating of material reflective of infra-red radiation, provided on one of said wire member and said inner surface,

whereby infra-red radiation of aid first wavelength transmitted through said wall is reflected back out of said tubular member by said coating and infra-red radiation of said second wavelength absorbed by said tubular member causes heating, and thus thermal expansion, of said wire member to operate said switching means.

4,631,391

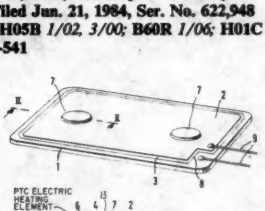
ELECTRICAL HEATING DEVICE, ESPECIALLY FOR MIRRORS

Günter Tiepke, Schnaittach, Fed. Rep. of Germany, assignor to Stettner & Co., Lauf, Fed. Rep. of Germany

Filed Jun. 21, 1984, Ser. No. 622,948

Int. Cl.[4] H05B *1/02, 3/00*; B60R *1/06*; H01C *1/148*

U.S. Cl. 219—541 **5 Claims**



1. An electrical heating device for a mirror comprising a pair of electrically conductive heating lining plates providing for heat distribution on a mirror, electrical conductors connected to said plates for connecting said plates to a source of power,

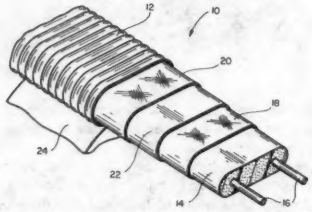
an insulating layer disposed between said plates, said electrical insulating layer having openings, and PTC resistor platelettes disposed in said openings and in electrical contact with said pair of plates, one of said plates having a larger area than said insulation layer such that the entire outer peripheral edge portion of said one plate is spaced outwardly of the outer peripheral edge of said insulating layer the other of said pair of plates not being larger in area than said insulating layer.

4,631,392

FLEXIBLE HIGH TEMPERATURE HEATER

Michael T. O'Brien, Union City; Umesh K. Sopory, San Jose, and Shou-Mean Fang, Union City, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jul. 13, 1984, Ser. No. 630,792
Int. Cl.[4] H05B *3/34*
U.S. Cl. 219—549 **10 Claims**



1. A method of heating a substrate, which method comprises placing adjacent the substrate and in thermal contact therewith an assembly comprising

(a) a flexible corrugated metal tube which is impervious to air, which has an elliptical cross-section and which has been made by deformation of a continuous non-corrugated tube, the metal of the metal tube being selected from the group consisting of an alloy of nickel, cobalt and iron, an alloy of copper and nickel, and stainless steel; the corrugations extending around the entire periphery of the tube, the tube having a wall thickness less than 0.012 inch, the depth of the corrugations being greater than 0.030 inch and the distance between corresponding points on adjacent corrugations being from 0.02 inch to 0.30 inch; and

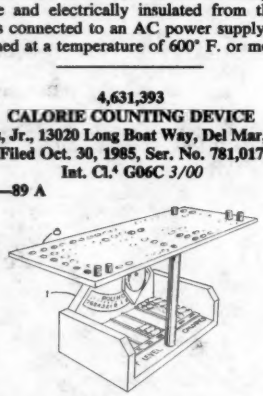
(b) an elongate high temperature resistive heating element which is within the tube, which is thermally coupled to the tube and which is connected to an AC power supply so that it is maintained at a temperature of 600° F. or more.

4,631,393

CALORIE COUNTING DEVICE

John R. Ross, Jr., 13020 Long Boat Way, Del Mar, Calif. 92014

Filed Oct. 30, 1985, Ser. No. 781,017
Int. Cl.[4] G06C *3/00*
U.S. Cl. 235—89 A **8 Claims**



1. A calorie counting device comprising:

a support structure,

a plurality of activity pieces comprised of solid matter, each piece representing a level of human activity and having a weight approximately proportional to the number of calories expended by a particular type of person engaged in said level of activity for a particular period of time,

a plurality of consumption pieces comprised of solid matter, each piece representing a number of calories consumed in food and/or drink and having a weight approximately proportional to said number of calories,

a balance board balanced on said structure along a line on said balance board defining a center line, said center line defining two sides of said balance board, such balance board comprising a plurality of location means for easy placement and removal of said activity pieces on one side and said consumption pieces on the other side, and

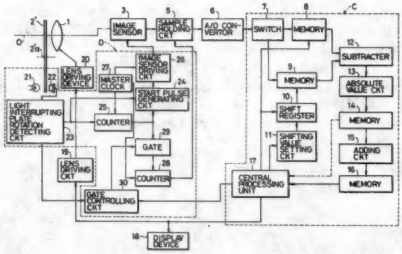
a scale means disposed on said support structure to indicate the net calories gained or lost during a time period or the net weight gained or lost during such period.

4,631,394

FOCUSING DEVICE FOR OPTICAL SYSTEMS

Yoshiaki Horikawa, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 436,488, Oct. 25, 1982, abandoned. This application Sep. 30, 1985, Ser. No. 781,329
Int. Cl.[4] G01J *1/20*; G03B *3/00, 13/18*
U.S. Cl. 250—201 **5 Claims**



1. A focusing device for optical systems comprising an image forming optical system, a light interrupting member located at the position of a pupil of said image forming optical system and having a first zone and second zone capable of passing a light bundle from an object, a photoelectric converting device arranged on the predetermined image forming surface of said image forming optical system, having a light receiving surface capable of receiving a first image formed by the light bundle having passed through said first zone and a second image formed by the light bundle having passed through said second zone and converting the light intensity distributions of said first image and second image respectively to electric signals, a central operation circuit being supplied with said electric signals and operating said electric signals according to a predetermined evaluating function and thereby generating resultant signals representing the direction and amount of displacement of said second image to said first image, and a driving means being supplied with said resultant signals and performing an auto-focusing according to said resultant signals.

4,631,395

OPTICAL APPARATUS FOR DETECTING THE FOCUSING STATE AND POSITIONAL ACCURACY OF A LIGHT BEAM DIRECTED ONTO AN OPTICAL DISK TRACKING GUIDE IN AN OPTICAL READ/WRITE SYSTEM

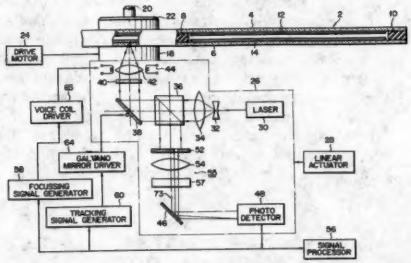
Hideo Ando, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Denki, Kawasaki, Japan

Continuation of Ser. No. 416,694, Sep. 10, 1982, Pat. No. 4,585,933. This application Jan. 8, 1986, Ser. No. 817,259

Claims priority, application Japan, Sep. 17, 1981, 56-146540; Sep. 17, 1981, 56-146542; Sep. 17, 1981, 56-146543; Oct. 22, 1981, 56-168966; Oct. 22, 1981, 56-168969

Int. Cl.[4] G11B *7/00*

U.S. Cl. 250—201 2 Claims



2. An optical system for controlling a light beam which is directed onto a light reflecting surface having a tracking guide, comprising:

means for generating a light beam;

objective lens means for converging said light beam into a converged light beam having a beam waist, and for directing said converged light beam onto said light reflecting surface to produce a beam spot on said tracking guide, said objective lens means being in focus when said beam spot is substantially equal in size to said beam waist and being out of focus when said beam spot is larger than said beam waist, and for directing light reflected from said light reflecting surface, said directed light having an optical path and containing a beam spot image with diffraction patterns which are caused by light reflected from said tracking guide;

refractor means, positioned in said directed light optical path to cause a first portion of said directed light to pass through said refractor means while a second portion of said directed light bypasses said refractor means, for refracting said first portion to produce refracted light;

projection lens means for reconverging said refracted light and said second portion of said directed light; and

photodetecting means for receiving the reconverged light and detecting the focus and tracking state of said converged light beam on said tracking guide, said photodetecting means including photosensitive regions to cause: (1) said refracted light and said second portion of said directed light to fall substantially symmetrically with respect to a first boundary between at least two of said regions when said converged beam is in focus on said tracking guide, (2) said refracted light and said second portion to fall predominantly asymmetrically with respect to said first boundary when said converged light beam is out of focus, (3) said diffraction patterns to fall symmetrically with respect to a second boundary between at least two of said regions when said converged light beam is properly tracking said tracking guide, and (4) said diffraction patterns to fall assymetrically with respect to said second boundary when said tracking is improper.

4,631,396

FOCUS ERROR DETECTION DEVICE

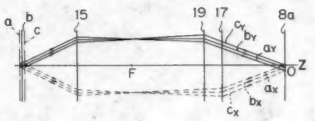
Yoshihiro Utsumi, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 16, 1983, Ser. No. 504,800

Claims priority, application Japan, Jun. 17, 1982, 57-090828[U]

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—201 3 Claims



1. A focus error detection device for use with a system for recording and reading out information, the system having an optical system including a source of light and an optical path for leading a light beam from the source of light onto a recording surface of a recording medium through an objective lens, said device comprising:

a beam splitter disposed in said cptical path between the source of light and the recording surface of the recording medium, for directing light reflected by the recording surface into a position for detection;

a photo detector for receiving the light from said beam splitter and for generating an output signal to be used for producing a focus error signal; and

first and second uniaxial lenses disposed between said beam splitter and said photo detector, said uniaxial lenses having axial directions which are substantially perpendicular to each other, and disposed so that a photo receiving surface of said photo detector is located between focal lines of said first and second uniaxial lenses, wherein said first and second uniaxial lenses are positioned and the focal lengths of said objective lens and of said first and second uniaxial lenses are determined that a distance between a focal plane of said optical system and a conjugate plane of said photo receiving surface defined by said first uniaxial lens is equal to a distance between said focal plane and a conjugate plane of said photo receiving surface defined by said second uniaxial lens, and that lateral magnifications between said conjugate planes and said photo receiving surface in a plane perpendicular to the axis of said first uniaxial lens and the axis of said optical path and in a plane perpendicular to the axis of said second uniaxial lens and the axis of said optical path are equal to each other.

4,631,397

FOCUSSING ERROR DETECTING APPARATUS EMPLOYING A COMPOSITE LENS

Kiyoshi Ohsato, Chiba, and Shigeo Kubota, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 29, 1984, Ser. No. 614,995

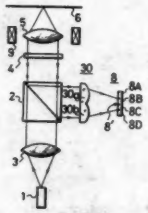
Claims priority, application Japan, May 31, 1983, 58-96058

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—201 2 Claims

1. A focussing error detecting apparatus comprising: a composite lens formed of a single lens made of glass and a single lens made of plastic; and a photodetector disposed behind said composite lens in opposed relation thereto, wherein said glass single lens has a uniform focal length, said plastic single lens is formed of a pair of lens regions divided by a flat interface including an optical axis of light incident on said composite lens, said pair of lens regions heve back focal lengths different from each other and optical axes spaced apart from each other, said photodetector is placed so that its photodetecting face is positioned at a middle point between converged points of light rays emitted from said pair of lens regions on the optical axis of

said incident light when said light incident on said composite lens is in the focussed state, and said photodetector is formed of first and second photodetecting sensors for receiving light rays passed through portions of the first lens region of said pair of lens regions which are respectively spaced apart from and adjacent to said flat interface and third and fourth photodetecting sensors for receiving light rays passed through portions of



the second lens region of said pair of lens regions which are respectively spaced apart from and adjacent to said flat interface so that a focussing error signal is produced from the difference between the sum of first and fourth photodetected signals from said first and fourth photodetecting sensors and the sum of second and third photodetected signals from said second and third photodetecting sensors.

4,631,398

APPARATUS FOR RECEIVING ELECTROMAGNETIC RADIATION

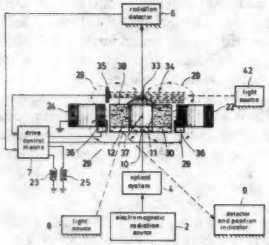
Lothar Liebing, Neuhausen, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

Filed Sep. 17, 1985, Ser. No. 776,919

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1984, 3434159

Int. Cl.⁴ H01J 3/14

U.S. Cl. 250—216 **10 Claims**



1. Apparatus for receiving electromagnetic radiation energy having varying angles of incidence and including an optical element (10) movable to continuously direct the radiation energy upon a detector (6), comprising

(a) an optical element (10) arranged to receive the electromagnetic radiation energy;

(b) shock-resistant means supporting said optical element for movement relative to said radiation detector, including

(1) a permanent magnet (12) upon which said optical element is mounted; and

(2) a plurality of coplanar diametrically-arranged circumferentially-spaced linear elements (31) each connected at one end with said magnet, said linear elements extending radially outwardly for connection at their remote ends with fixed locations relative to said radiation detector, said linear elements normally supporting said magnet in a first plane for pivotal movement about pivot axes positioned in said first plane, said linear elements also supporting said magnet for displacement in a direction normal to said first plane;

(c) drive means for adjusting the position of said optical element relative to the radiation detector, said drive means including a plurality of selectively energizable coils (22–25) arranged circumferentially about said magnet adjacent the electromagnetic field thereof, the axes of said coils being normal to said magnet plane;

(d) means for controlling said drive means as a function of the displacement of the magnet from its first position in a direction normal to said magnet plane, including

(1) a spherical segment (33) secured to a face of said magnet parallel with said first plane, the central point of generation (37) of said segment being coincident with the center point of said magnet; and

(2) a light source (42) and a light detector (35) mounted in fixed relation relative to said radiation detector adjacent said magnet end face in diametrically opposite relation relative to said segment, said light source producing light rays (34) that extend parallel with said end face for at least partial interruption by said spherical segment when said magnet is in said first position;

(3) said light detector being operable to supply to said drive means a control signal that is a function of the magnitude of the light rays received thereby.

4,631,399

MULTIPOSITION ROTARY SWITCH WITH PHOTOTRANSISTORS

Russell G. Ward, 2050 SW. 71st Ave., Portland, Oreg. 97225

Filed May 30, 1984, Ser. No. 615,226

Int. Cl.⁴ G01V 9/04

U.S. Cl. 250—221 **9 Claims**

1. A finger actuated switch comprising,

a housing defining an open area,

a light source in said housing in circuit with a power source,

phototransistors in said housing and located adjacent said open area and each having an electrode in circuit with a power source,

a manually positionable rotor in said housing open area and having an exposed surface for contact by the user's finger and including light transmission means for communicating light from said light source to one of said phototransistors and operable so as to selectively subject one of said phototransistors to light so as to perform a switching function, and

said phototransistors each having a second electrode in circuit with a lead routed exteriorly of the housing.

4,631,400

CORRELATING OPTICAL MOTION DETECTOR

John E. Tanner, and Carver A. Mead, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

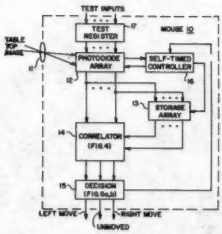
Filed Jan. 20, 1984, Ser. No. 572,698

Int. Cl.⁴ G01V 9/04

U.S. Cl. 250—221 **8 Claims**

1. An optical motion detector comprised of a linear array of photodiodes, means for focusing an image onto said array, means for sampling and storing pixels of said image for correlation with pixels of a new image from said array, at least three distinct correlators, a first correlator in which stored pixels are

offset relative to pixels of a new image in one of two directions for detection of motion in said one direction, a second correlator in which stored pixels are not offset relative to pixels of the new image, and a third correlator in which stored pixels are offset relative to pixels of the new image in the second of said



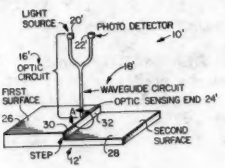
two directions for detection of motion in said second direction, and means for detecting which correlator has the greatest value as an indication of direction of motion associated with said first and third correlators in said one direction or said second direction, or no motion when said second correlator has the greatest value.

4,631,401

OPTIC SENSORS

Larry E. Parkhurst, Boulder, and Michael R. Meadows, Nederland, both of Colo., assignors to Dieterich Standard Corporation, Boulder, Colo.

Filed Jun. 6, 1984, Ser. No. 617,889
Int. Cl.[4] H01J 5/16
U.S. Cl. 250—227 **10 Claims**



2. The sensor as defined in claim 1 wherein each first and second optic circuit has a sensing end; said second region fabricated such that motion of the said boundary between said first surface and second region modulates the light flux density reflected from the light reflecting means; means mounting the reflecting means whereby the motion of said first reflective surface and the boundary between the first reflective surface and the second region is primarily transverse to the light propagation at the sensing ends of the first and second optic circuits; and wherein the sensing end of the first optic circuit is mounted adjacent the first reflective surface and the sensing end of the second optic circuit is mounted adjacent said boundary between the first reflective surface and the second region.

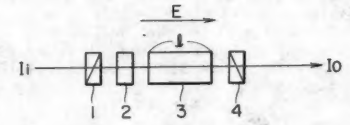
4,631,402

OPTICAL ELECTRIC-FIELD MEASURING APPARATUS

Kazuyuki Nagatsuma, Hachioji; Kazumasa Takagi, Tokyo, and Hiroyoshi Matsumura, Saitama, all of Japan, assignors to Hitachi, Ltd. and Hitachi Cable, Ltd., both of Tokyo, Japan

Filed Feb. 1, 1984, Ser. No. 575,783
Claims priority, application Japan, Feb. 10, 1983, 58-19822
Int. Cl.[4] G01D 5/34
U.S. Cl. 250—231 R **15 Claims**

1. An optical electric-field measuring apparatus, comprising a light source part, an electric-field sensing part including a material with electrooptic effect for varying intensity of light produced by said light source part in correspondence with intensity of an electric field to be measured, a measuring part for measuring intensity of light output from said electric-field sensing part, and light transmission paths for optically coupling said light source part, said electric-field sensing part and said measuring part, wherein at least one electrooptical crystal element arrayed along the light traveling direction having a crystallographically eulytite structure and belonging to a point group $\bar{4}3$ m is used as said material with electrooptic effect, and



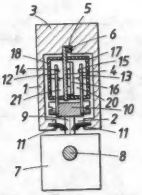
wherein said at least one electrooptic crystal element having a crystallographically eulytite structure and belonging to a point group $\bar{4}3$ m has an effective whole length within said at least one electrooptic crystal as measured in the light traveling direction that is greater than a common length at which the same modulation degree is produced when using an electrooptical crystal having a crystallographically eulytite structure and belonging to a point group $\bar{4}3$ m and when using an electrooptical crystal belonging to point group 23.

4,631,403

LENGTH MEASURING INSTRUMENT COMPRISING A SCALE MEMBER AND A SIGNAL-GENERATING SCANNING UNIT WHICH IS MOVABLE ALONG THE SCALE MEMBER

Heinz Rieder, St. Pantaleon, and Max Schwaiger, Ostermiething, both of Austria, assignors to RSF Elektronik Gesellschaft m.b.H., Tarsdorf, Austria

Filed Jan. 2, 1986, Ser. No. 815,991
Claims priority, application Austria, Jan. 11, 1985, 56/85
Int. Cl.[4] H01J 3/14, 5/16
U.S. Cl. 250—237 G **10 Claims**



1. In a length measuring instrument comprising
a scale carrier,
an elongate scale member secured to said scale carrier and provided with a longitudinal scale, and
a scanning unit, which is associated with and movable along said scale member and comprises signal-generating means for scanning said scale and covering hood means which are open toward said scale member and define with said scale member at least one measuring chamber, which contains said signal-generating means,
said covering hood means having at the periphery of said at least one measuring chamber at least one annular boundary surface facing said scale member,
said covering hood means being provided with elastomeric scraping means disposed at said boundary surface and in sealing sliding contact with said scale member,

the improvement residing in that

said elastomeric scraping means comprise at least one annular seal, which is in sealing sliding contact with said scale member under initial compressive stress throughout the peripheral extent of said boundary surface.

4,631,404
POSITION MEASURING SYSTEM

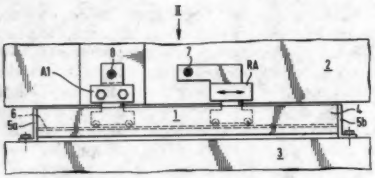
Horst Burkhardt, Truchtlaching; Alfons Ernst; Holmer Dangschat, both of Traunreut, and Horst Wogatzke, Neuss, all of Fed. Rep. of Germany, assignors to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Apr. 17, 1985, Ser. No. 724,189

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415091; May 30, 1984, 3420187; Oct. 23, 1984, 3438750; Mar. 19, 1985, 3509838

Int. Cl.[4] H01J *3/14*

U.S. Cl. 250—237 G **22 Claims**



1. In a system for measuring the relative position of first and second objects movable relative to one another, of the type comprising at least one measuring graduation carrier connected to the first object, a measuring incremental graduation defined by the measuring graduation carrier, at least one measuring scanning unit connected to the second object to scan the measuring incremental graduation, and means for defining at least one reference position at a selected absolute position with respect to the measuring incremental graduation, the improvement comprising:

at least one reference scanning unit for scanning the at least one reference position, said reference scanning unit mounted to move independently of the measuring scanning unit, the first object, and the second object, said reference scanning unit comprising means for scanning the at least one reference position; and

means for determining the distance between a scanned one of the reference positions and the measuring scanning unit in order to determine the absolute position of the measuring scanning unit with respect to the scanned reference position.

4,631,405
METHOD AND APPARATUS FOR DUAL-SPACED FAST/EPITHERMAL NEUTRON POROSITY MEASUREMENTS

Harry D. Smith, Jr., Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 5, 1984, Ser. No. 678,423

Int. Cl.[4] G01V *5/00*

U.S. Cl. 250—266 **2 Claims**

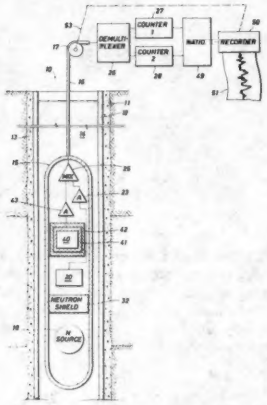
1. A method for determining the porosity of earth formations in the vicinity of a well borehole, comprising:

(a) irradiating the earth formations in the vicinity of the well borehole with a continuous chemical type source of fast neutrons,

(b) detecting the fast neutron population at a first shorter spaced distance from the neutron source in the borehole and generating signals representative thereof,

(c) detecting the epithermal neutron population at a second spaced distance from the neutron source in the borehole and generating signals representative thereof, said second spaced distance being greater than the first spaced distance from said neutron source,

(d) forming a ratio of the signals representing the fast and epithermal neutron populations to derive a measurement signal functionally related to the porosity of the earth formations in the vicinity of the borehole, and



(e) calibrating said measurement signal according to a predetermined functional relationship to derive a porosity signal quantitatively representative of the porosity of the earth formations in the vicinity of the borehole.

4,631,406
INFRARED RAY DETECTOR

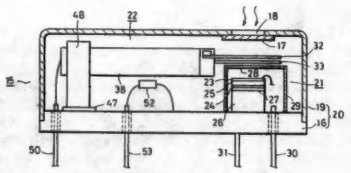
Takeshi Nakata, Shiga, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Nov. 2, 1984, Ser. No. 667,542

Claims priority, application Japan, Nov. 18, 1983, 58-218235

Int. Cl.[4] G01J *1/00*

U.S. Cl. 250—338 **8 Claims**



1. An infrared ray detector comprising:

an infrared ray detecting member for generating electric charges in response to changes in the amount of incident infrared rays;

a pair of opposing members disposed in the area of incidence of infrared rays on said detecting member, each having a plurality of infrared ray transmitting portions and infrared ray non-transmitting portions;

a vibrator for vibrating at least one of said pair of opposing members; and

driving signal supplying means supplying a driving signal for driving said vibrator so that relative positional relation between said pair of opposing members is periodically changed;

wherein the amplitude of said driving signal is selected to be smaller than the maximum amplitude of a driving signal

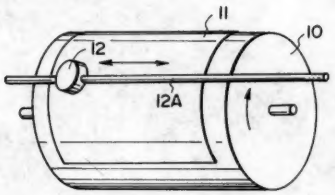
employed in a case where there are periodically repeated a first state in which said infrared ray transmitting portions of said opposing members are completely overlapped to be most opened and a second state in which said infrared ray transmitting portions of one opposing member and said infrared ray non-transmitting portions of the other opposing member are completely overlapped whereby said infrared ray transmitting portions are most blocked, in changing said relative positional relation between said opposing members.

4,631,407

RADIATION IMAGE INFORMATION READ-OUT SYSTEM

Kazuhiro Kawajiri; Hiroshi Sunagawa; Nobuharu Nozaki; Yuichi Hosoi, and Kenji Takahashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 19, 1984, Ser. No. 673,234
Claims priority, application Japan, Nov. 21, 1983, 58-219314
Int. Cl.[4] G03C *5/16*
U.S. Cl. 250—327.2 **5 Claims**



1. A radiation image information read-out system comprising point-source light for projecting a spot of stimulating rays onto a stimulable phosphor sheet carrying a radiation image stored therein, a solid state photoelectric converter which is opposed to the spot-like portion of the stimulable phosphor sheet exposed to the spot of stimulating rays and is adapted to receive light emitted from the spot-like portion to convert it into an electric signal, and driving means for simultaneously moving the point-source light associated with the solid state photoelectric converter and the solid state photoelectric converter with respect to the stimulable phosphor sheet to scan the same.

4,631,408

METHOD OF SIMULTANEOUSLY DETERMINING GAUGE AND ORIENTATION OF POLYMER FILMS

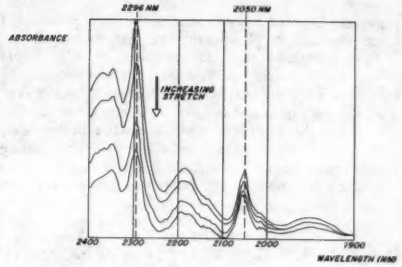
David Zeimanovic, Monsey, and Stanley J. Kishner, Pomona, both of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Sep. 24, 1984, Ser. No. 653,962
Int. Cl.[4] G01J *1/00*
U.S. Cl. 250—339 **28 Claims**

1. Method of determining, simultaneously, the thickness and absorption coefficients of each of the materials in a multilayer structure, comprising the steps of:

measuring the first optical absorbance of each material of said multilayer structure at two or more wavelengths; and

analyzing said first optical absorbances to simultaneously determine the thicknesses and absorption coefficients of



said materials and, from said absorption coefficients, determine the degree of orientation of each said material.

4,631,409

SCINTILLATOR CRYSTAL HAVING A HIGHLY REFLECTIVE SURFACE

Frank M. Sparacia, Solon, and Oley D. Wimer, Hudson, both of Ohio, assignors to Harshaw/Filtrol, Cleveland, Ohio

Filed Apr. 3, 1984, Ser. No. 596,480
Int. Cl.[4] G01T *1/20*
U.S. Cl. 250—361 R **12 Claims**

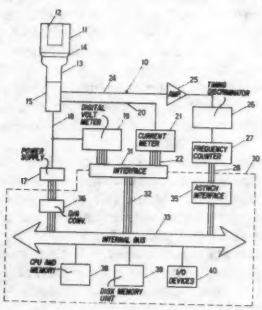
1. An inorganic scintillation crystal selected from the group consisting of inorganic halides and inorganic oxides wherein the crystal emits light pulses in the 200–700 nm range when the crystal is subjected to ionizing crystal is subjected to ionizing radiation, said crystal having at least one surface coated with a reflective layer capable of reflecting said light pulses back into the crystal, said layer comprising particles of barium sulfate and a binder consisting essentially of sodium silicate.

4,631,410

METHOD AND APPARATUS FOR MEASUREMENT OF RADIOACTIVITY OVER AN EXTENDED RANGE

Robert J. Nickles, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Oct. 3, 1984, Ser. No. 657,397
Int. Cl.[4] G01T *1/167, 1/161*
U.S. Cl. 250—363 R **17 Claims**



1. Apparatus for measuring radioactivity over an extended range of activity levels comprising:

(a) a body of scintillator material;

(b) a photomultiplier tube mounted adjacent to the scintillator body to receive light flashes therefrom and having an anode, a cathode, and a plurality of dynodes;

(c) means for biasing the anode, cathode and dynodes of the photomultiplier tube to provide an acceleration voltage for electrons from the cathode across the dynodes to the anode;

(d) means for selectively measuring the current flowing from the anode of the photomultiplier tube resulting from scintillation events in the scintillator body sufficient to cause a measurable current to flow from the anode; and

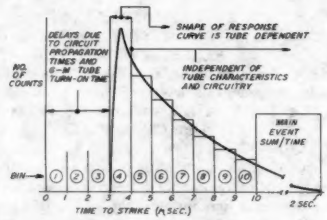
(e) means for selectively counting the rate of electron pulses in the photomultiplier tube resulting from scintillation events in the scintillator body, and wherein the means for measuring anode current and the means for counting the electron pulse rate are capable of doing so simultaneously over an intermeidate rate range of scintillation events.

4,631,411

RADIATION MEASURING APPARATUS AND METHOD

Charles V. Noback, Cresskill, N.J., assignor to Nuclear Research Corp., Warrington, Pa.

Filed Dec. 19, 1984, Ser. No. 683,666
Int. Cl.[4] G01T *1/18*
U.S. Cl. 250—374 **20 Claims**


DELAYS DUE TO CIRCUIT PROPAGATION TIMES AND U-M TUBE TURN-ON TIME
SHAPE OF RESPONSE CURVE IS TUBE DEPENDENT
INDEPENDENT OF TUBE CHARACTERISTICS AND CIRCUITRY
NO. OF COUNTS
BIN
TIME TO STRIKE (μSEC.)
2 SEC.

1. Apparatus for measuring radiation field strength comprising in combination,

(a) a biased potential radiation detector having an output circuit, said detector being of the type that is effective when biased to respond to impingement of radiation by generating an output pulse at its output circuit, and when not biased being ineffective to generate an output pulse when impinged by radiation,

(b) biasing means operatively coupled to said radiation detector for selectively biasing said radiation detector to generate an output pulse in response to impingement by radiation,

(c) time counting means including timing control means operable to start and terminate time counting, said radiation detector output circuit being operatively coupled to said time counting means and being effective upon generation of an output pulse to cause said time counting means to terminate time counting,

(d) actuatable time count storage means operatively coupled to said time counting means and effective when actuated to store the time count registered by said time counting means,

(e) a plurality of selectably actuatable event count storage means effective when selectively actuated to register an event count in the selected one of said plurality of event count storage means whenever said radiation detector generates an output pulse,

(f) master control means operatively coupled to

(1) said biasing means to selectively cause said biasing means to bias said radiation detector to respond to impingement by radiation,

(2) said time counting means any effective to cause said time counting means to start time counting simultaneously with the operative biasing of said radiation detector, said master control means receiving a signal when said radiation detector generates an output pulse.

(3) said time count storage means and effective to actuate the latter to cause the time count registered by said time counting means to be stored in said time count storage means when said registered time count is equal to or greater than a predetermined value as monitored by said master control means,

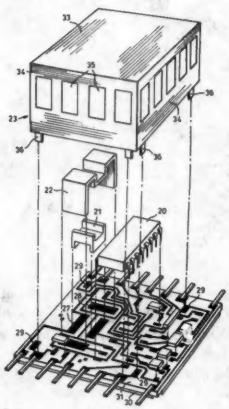
(4) said plurality of event count storage means and effective to cause an event count to be stored in a first selected one of said plurality of event count storage means when the time count registered in said time counting means is stored in said time count storage means, and effective to cause an event count to be stored in a different selected one of said plurality of event count storage means when the time count registered in said time counting means is less than the said predetermined value.

4,631,412

IONIZATION SMOKE DETECTOR

Zbigniew Turlej, 655 Indian Road, Mississauga, Ontario, Canada (L5H 1R2)

Filed Oct. 9, 1984, Ser. No. 658,918
Claims priority, application Canada, Oct. 21, 1983, 439445
Int. Cl.[4] G01T *1/185*; G08B *17/10*
U.S. Cl. 250—381 **8 Claims**



1. An ionization smoke detector comprising an electrode system and electronic circuitry interconnected therewith for deriving an electrical signal in response to the detection of smoke, the electronic circuitry providing terminals for connection to an alarm device,

the electrode system comprising an inner electrode providing a source of ionizing radiation, an outer electrode providing openings to allow smoke to pass therethrough, and an auxiliary electrode positioned to define with said inner and outer electrodes, respectively, a first and a second ionization chamber disposed one within the other, the auxiliary electrode having a hole capable of passing radioactive rays so as to produce ionization simultaneously in both chambers,

wherein the electrodes and electronic circuitry are surface mounted on one side of a support plate, the outer electrode conforming to the configuration and dimensions of the support plate so as to form therewith a box-like enclosure for the inner and auxiliary electrodes and electronic circuitry so mounted, the detector further comprising a shield plate laminated to the other side of the support plate and electrically connected to the outer electrode to form an electrically shielded enclosure for the electronic circuitry.

4,631,413

METHOD FOR QUALITY CONTROL OF PRODUCTS FROM FISH, CATTLE, SWINE AND POULTRY

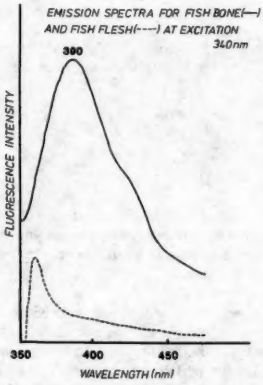
Svend A. K. Jensen, Soborg; Lars Munck, Helsingor; Poul Sigsgaard, Helsinge, and Hans H. Huss, Copenhagen, all of Denmark, assignors to De Forenede Bryggerier A/S, Copenhagen, Denmark

Filed Jun. 7, 1984, Ser. No. 618,161

Claims priority, application Sweden, Jun. 13, 1983, 8303327; Aug. 5, 1983, 8304288

Int. Cl.[4] G01N *21/64*

U.S. Cl. 250—458.1 23 Claims



1. A method for quality control of products from fish, meat, cattle, swine and poultry, for instance for controlling a process for treating or handling such products, characterised in that the product to be subjected to quality control, or a sample thereof, is exposed to excitation electromagnetic radiation within the range of about 325–360 nm, preferably about 340 nm, that any fluorescent radiation emitted by the product as a result of this irradiation, is analysed for identifying characteristic fluorescence from biological components in the product or a sample thereof, the presence of such biological components determining the quality of the product, and that said quality control is carried out in dependence upon the analysis result.

4,631,414

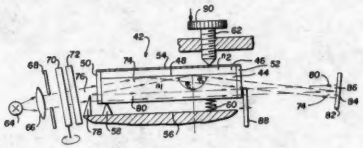
RADIOLOGICAL INSTRUMENT

Stanley Kronenberg, Skillman, N.J.; William L. McLaughlin, Washington, D.C., and Carl R. Seibentritt, Jr., McLean, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 20, 1985, Ser. No. 778,120

Int. Cl.[4] G01T *1/02*

U.S. Cl. 250—474.1 19 Claims



1. An instrument for measuring radiation, particularly nuclear radiation, comprising:

a radiation sensitive structure pivoted toward one end and including a pair of elongated solid members contiguously joined together along their length dimensions and having a common planar interface therebetween, one of said pair of members being comprised of radiochromic material whose index of refraction changes due to anomolous dispersion as a result of being exposed to nuclear radiation, said pair of members further having mutually different indices of refraction with the member having the larger index of refraction further being transparent for the passage of light and of energy therethrough;

means located toward the other end of said structure for varying the angle of longitudinal elevation of said pair of members;

means for generating and projecting a beam of light into one end of said member having the larger index of refraction, said beam of light being projected toward said planar interface where it is reflected out of the other end of said same said member as a first output beam;

means projecting a portion of said beam of light into said one end of said member having the larger index of refraction where it traverses therethrough without reflection and out of the other end of said same said member as a second output beam; and

means adjacent said structure for receiving said first and second output beams, whereby a calibrated change in the angle of elevation of said structure between positions of equal intensity of said first and second output beams prior to and following exposure provides a measure of the radiation sensed due to a change of refraction of said radiochromic material.

4,631,415

RADIATION TREATMENT APPARATUS

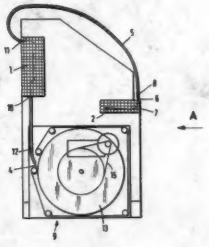
Kurt Sauerwein, Bergische Strasse 16, D-5657 Haan 1; Norbert Kinzer, and Karl Weinlich, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Kurt Sauerwein, Haan, Fed. Rep. of Germany

Filed Sep. 25, 1984, Ser. No. 654,296

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335438

Int. Cl.[4] G21F *5/02*

U.S. Cl. 250—497.1 13 Claims



1. A radiation treatment apparatus comprising

a first radiation shielding container comprising a rest container having a plurality of first openings,

a plurality of flexible hoses connected to said openings respectively,

a plurality of drive cables extending through said flexible hoses respectively,

a plurality of radiator holders connected to said drive cables respectively, said radiator holders are axially insertable and removable from said openings by means of a respec-

tive of said drive cables through a respective of said flexible hoses,

a common single drive means connected to all of said drive cables for joint movement of all said drive cables and therewith for joint insertion and joint removal of said radiator holders into and from said openings, respectively, via said drive cables,

a second radiation shielding container comprising an intermediate container having a plurality of second openings for selectively receiving respective of said radiation holders,

a plurality of means comprising hose coupling elements for producing detachable through-connections of free ends of said flexible hoses, respectively, selectively to one of a respective of said second openings and a respective hollow probe for treatment,

all of said plurality are the same in number,

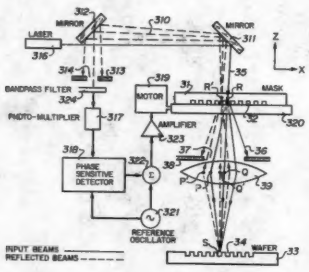
said drive means further for simultaneously inserting said radiation holders which are selected for treatment into the respective hollow probes and for simultaneously inserting said radiation holders which are not selected for treatment into the respective second openings, whereby the radiator holders not selected at the time for treatment are guided through said respective flexible hoses into the respective second openings in the second radiation shielding container while the radiation holders selected at the time for treatment are guided into the respective hollow probes.

4,631,416

WAFER/MASK ALIGNMENT SYSTEM USING DIFFRACTION GRATINGS

William R. Trutna, Jr., Atherton, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 19, 1983, Ser. No. 564,854
Int. Cl.[4] G01B *9/02, 11/27*
U.S. Cl. 250—548 **13 Claims**



1. A method of aligning a first object with a second object, said method comprising the steps of:

(a) diffracting light from a first diffraction grating on the first object to the second object;

(b) diffracting light from the first diffraction grating off of a second diffraction grating on the second object to produce a zeroth order output beam from the second grating; and

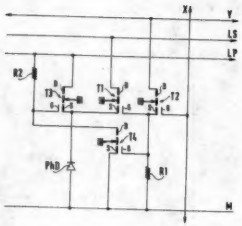
(c) varying, in a first direction, the relative position between the first object and the second object until the intensity of the zeroth order output beam is at an extremum with respect to such positional variation in order to align these two objects in the first direction.

4,631,417

ADDRESSABLE PHOTODETECTOR ARRAY

Michel Brillman, Bruyeres le Chatel, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jun. 27, 1984, Ser. No. 625,159
Claims priority, application France, Jun. 29, 1983, 83 10719
Int. Cl.[4] H04N *5/335*
U.S. Cl. 250—578 **7 Claims**



1. Matrix array of addressable photodetectors comprising:

an output line common to each of said photodetectors,

a biasing line common to each of said photodetectors,

row addressing lines,

column addressing lines,

a ground connection to each photodetector, and

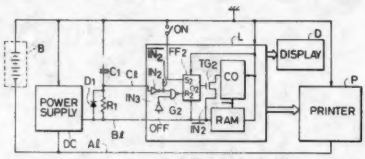
a respective addressing circuit associated with each photodetector each addressing circuit comprising first means for connecting said each photodetector to said output line, second means for connecting said each photodetector to said biasing line, third means connected to said biasing line and to ground for controlling said second means, and fourth means connected to one of said row addressing lines and to one of said column addressing lines and to ground for controlling said first and third means, wherein said first, third and fourth means are turned off and said second means are turned on in the absence of signals on said row and column addressing lines, and said first, third and fourth means are turned on and said second means are turned off when signals are applied to said row and column addressing lines to select said each photodetector associated with said addressing circuit.

4,631,418

POWER SUPPLY CONTROL DEVICE

Shigeru Toyomura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 503,856, Jun. 13, 1983, abandoned.
This application Nov. 12, 1985, Ser. No. 796,540
Claims priority, application Japan, Jul. 15, 1982, 57-123146
Int. Cl.[4] H03K *19/003*; G06F *1/00*
U.S. Cl. 307—200 A **7 Claims**



1. A power supply control device for use in battery-powered electronic apparatus, comprising:

transfer gate means connected between a battery and the battery-powered electronic apparatus for selectively sup-

plying power to the battery-powered electronic apparatus;

a flip-flop circuit for selectively opening and closing said transfer gate means;

means for generating a first signal upon electrical loading the battery; and

means for generating a second signal to instruct the start of operation of the battery-powered electronic apparatus;

wherein said flip-flop circuit receives the first signal at one input thereof and the second signal at the other input thereof so that said transfer gate means is opened by the first signal and is subsequently closed by the second signal to supply power to the battery-powered electronic apparatus.

4,631,419

TRANSISTOR SWITCH AND DRIVER CIRCUIT

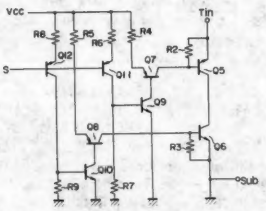
Hiroshi Sadamatsu; Yoshio Wada, both of Yokohama, and Hideaki Ito, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 23, 1983, Ser. No. 565,177

Claims priority, application Japan, Dec. 28, 1982, 57-233563

Int. Cl.⁴ H03K *17/60, 3/26*

U.S. Cl. 307—255 **4 Claims**



1. A switch circuit, having a control input terminal and an output terminal, comprising:

first and second transistors, for receiving an input voltage, each having a collector and emitter and a base, the collectors of said first and second transistors being interconnected, the emitter of said first transistor being connected to said output terminal, and the emitter of said second transistor being connected to ground;

a first series circuit comprising a first resistor and a third transistor connected in series thereto, said third transistor having a collector, an emitter and a base, one terminal of said first resistor being connected to a constant power source potential, the other terminal of said first resistor being connected to one terminal of an electric current path of the emitter and the collector of said third transistor, and the other terminal of said electric current path of said third transistor being connected to the base of said first transistor;

a second series circuit comprising a second resistor and a fourth transistor connected in series thereto, said fourth transistor having a collector, an emitter and a base, one terminal of said second resistor being connected to said constant power source potential, the other terminal of said second resistor being connected to one terminal of an electric current path of the emitter and the collector of said fourth transistor, and the other terminal of said electric current path of said fourth transistor being connected to the base of said second transistor; and

bias circuit means connected to the bases of said third and fourth transistors, having a first state and a second state, for receiving at said control input terminal a control signal switchable between first and second levels, said bias circuit means changing from said first state to said second state in accordance with a change in said control signal from said first level to said second level, thereby changing the state of conduction of said third and fourth transistors simultaneously to switch the voltage level at said output terminal.

4,631,420

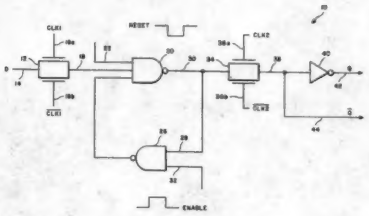
DYNAMIC FLIP-FLOP WITH STATIC RESET

Ernest E. Hollis, Bedford, and Joseph H. Born, Boston, both of Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 9, 1984, Ser. No. 578,445

Int. Cl.⁴ H03K *3/284, 17/56*

U.S. Cl. 307—272 R **4 Claims**



1. An asynchronously resettable high-speed dynamic flip-flop comprising:

A. a state gate, having an output port and reset and data input ports, for presenting a first, set value at its output port when the values at its input ports, including a latch input port, are all true and for presenting a second, reset value at its output port when at least one of the values at its input ports is false;

B. a first transmission gate, having an input port, a clock port, and an output port connected to the data input port of the state gate, for presenting at its output port the value of the signal at its input port when the signal at its clock port has a first, enabling value and for maintaining at the state-gate input ports, while the signal at its clock port has a second, disabling value, the value that the signal at its input port had when the signal at its clock port assumed the disabling value;

C. a second transmission gate having a clock port, an output port connected to a capacitive load, and an input port connected to receive the signal at the output port of the state gate, for presenting at its output port the value of the signal at its input port when the signal at its clock port is has a first, enabling value and for maintaining on said capacitive load connected to its output port, while the signal at its clock port has a second, disabling value, the value that the signal at its input port had when the signal at its clock port assumed the disabling value, the flip-flop thereby operating synchronously as a D-type flip-flop when appropriate clock signals are applied to its clock input ports but being asynchronously resettable by application of a false signal to its reset input port;

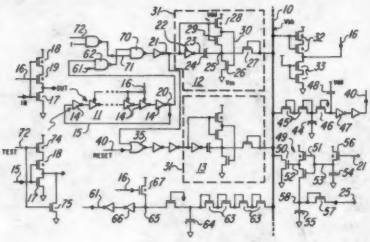
D. a latch gate having a feedback input port connected to receive the state-gate output, the latch gate also having an enable input port and having an output port connected to the latch input port of the state gate, the latch gate presenting at its output port a false value when the signal at its enable port has a first, enable value and the output of the state gate is at its reset value, the output of the latch gate being true when the signal at its enable port has a second, disable value or the output of the state gate is at its set value, the flip-flop, once it has assumed its reset state, remaining in said reset state only so long as the signal at the enable input port has the enable value, and selectively being returned to a state in which the signal on the output port of the flip-flop becomes equal to the signal of the data input to the flip-flop after the flip-flop has been clocked and a suitable propagation time has elapsed upon the

signal at the enable input port returning to the disable value.

4,631,421
CMOS SUBSTRATE BIAS GENERATOR

Shinji Inoue, and Rama S. Akundi, both of Houston, Tex., assignors to Texas Instruments, Dallas, Tex.

Filed Aug. 14, 1984, Ser. No. 640,720
Int. Cl.[4] H03L *1/00*
U.S. Cl. 307—297 **14 Claims**



1. A substrate bias generator circuit comprising:

a bias node,

means for generating a feedback signal related to the voltage on said bias node,

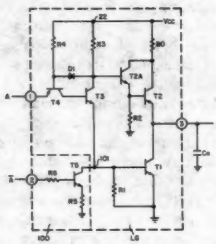
an oscillator responsive to said feedback signal so that its frequency is inversely related to the voltage on said bias node, and

a charge pump circuit comprising a capacitor, a transistor having a source-to-drain path in series with the capacitor and having a gate, buffer means coupling the output of the oscillator to one side of said capacitor, a CMOS inverter, responsive to the output of the oscillator and connected to said gate, for coupling said gate to the other side of said capacitor or to a voltage supply dependent upon the output of the oscillator, and a diode having an anode connected to said bias node and having a cathode connected to said other side of said capacitor.

4,631,422
TTL CIRCUIT WITH A CLAMPING TRANSISTOR FOR SPEEDY TURN-OFF OF OUTPUT TRANSISTOR

Douglas S. Piasecki, Middletown Township, Monmouth County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 19, 1983, Ser. No. 562,529
Int. Cl.[4] H03K *19/013, 19/088*
U.S. Cl. 307—300 **8 Claims**



1. The combination comprising:

first and second power terminals for the application therebetween of an operating potential;

first, second, third and fourth transistors of same conductivity type, each transistor having first and second electrodes defining the ends of its main conduction path, and a control electrode whose potential relative to said first electrode determines the conductivity of the transistor;

an input terminal and a control terminal;

means for applying external signals to said input and control terminals, said external signals being independent of the signals produced at the first and second electrodes of said first, second, third and fourth transistors;

an output terminal;

means coupling the main conduction path of said first transistor between said output terminal and said first power terminal;

means coupling the main conduction path of said second transistor between said output terminal and said second power terminal;

means coupling the main conduction path of said third transistor between the control electrodes of said first and second transistors;

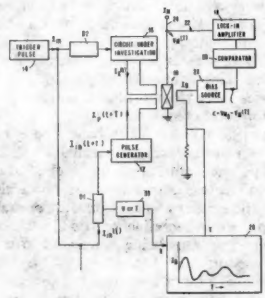
means coupling the main conduction path of said fourth transistor between the control electrode of said first transistor and said first power terminal; and

means coupling the control electrode of said third transistor to said input terminal and means coupling the control electrode of said input terminal and means coupling the control electrode of said fourth transistor to said control terminal, responsive to the signals at said input and control terminals, for turning-on said fourth transistor and turning off said first transistor when said third transistor is being turned-off.

4,631,423
ULTRA HIGH RESOLUTION JOSEPHSON SAMPLING TECHNIQUE

Sadeg M. Faris, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 105,674, Dec. 20, 1979, Pat. No. 4,401,900. This application Jul. 25, 1983, Ser. No. 516,836
The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.
Int. Cl.[4] H03K *17/92*
U.S. Cl. 307—352 **11 Claims**



1. A sampling system for measuring unknown signals, comprising:

a monitor gate having at least two distinguishable states to which said unknown signal is applied as a control signal along with a sampling pulse and an adjustable bias signal,

switching means for switching the state of said monitor gate, said switching means including a source of said unknown signal, a source of said sampling pulse, and a source of said adjustable bias signal,

noise elimination means for unambiguously defining the switching threshold of said monitor gate, said noise elimination means including means for time averaging the output of said monitor gate and being connected in a feedback loop between said source of bias signals and said

monitor gate, said means for time averaging including means for applying an error signal to said source of bias signals in order to adjust the amplitude of said bias signal to that exact amplitude which switches the state of said monitor gate,

a monitor gate source for providing a signal through said monitor gate of a predetermined value,

timing means for providing a timing reference and an accurate sampling delay time, said timing means including means for initiating the sampling of said unknown signal by said monitor gate and means for establishing a sampling delay time, said timing means including said source of sample pulses and a delay means for establishing a delay in the application of said sample pulses with respect to the application of said unknown signals,

a trigger pulse source for providing trigger pulses to said source of unknown signals and to said source of sampling pulses to initiate the application of said unknown signal to said monitor gate and the application of said sampling pulse to said monitor gate,

means for recording the state of said monitor gate at the instance of each said sampling pulse application, said recording means including means relating the magnitude of said bias signal to the magnitude of said unknown signal at each sampling instant.

4,631,424

MULTI-INPUT LOGIC CIRCUIT

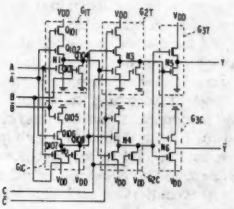
Isamu Miyagi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1983, Ser. No. 480,610

Claims priority, application Japan, Mar. 30, 1982, 57-52031

Int. Cl.⁴ H03K *19/094*

U.S. Cl. 307—448 **5 Claims**



1. A multi-input logic circuit comprising:

(a) an input logic stage performing a predetermined logic operation with respect to a first plurality of logic input signals, said input logic stage including:

first receiving means for receiving said first plurality of logic input signals;

second receiving means for receiving a second plurality of logic input signals that are complementary to said first plurality of signals;

a first power source terminal to which a first voltage is applied;

a second power source terminal to which a second voltage is applied;

a first transistor combination circuit coupled between a first output terminal and said second power source terminal, said first transistor combination circuit having a plurality of enhancement field effect transistors, each connected to said first receiving means for receiving a different one of said first plurality of logic input signals and providing a current path between said first output terminal and said second power source terminal only when the combination of said first plurality of logic input signals is in a predetermined state;

a second transistor combination circuit coupled between said first power source terminal and said first output terminal, said second transistor combination circuit having a plurality of depletion field effect transistors, each connected to said second receiving means for receiving a different one of said second plurality of logic signals, and providing a current path of a first resistance between said first power source terminal and said first output terminal when said first logic input signals are in said predetermined state and providing a current path of a second resistance therebetween at all other times, said second resistance being lower than said first resistance;

(b) a second multi-input logic stage for producing an output signal that is complementary to the output signal at said first output terminal, said second logic stage including:

a second output terminal,

a third transistor combination circuit having a plurality of enhancement field effect transistors coupled between said second output terminal and said second power source terminal, said third transistor combination circuit being connected to said means for receiving said second plurality of logic input signals, and

a fourth transistor combination circuit having a plurality of depletion field effect transistors coupled between said first power source terminal and said second output terminal, said fourth transistor combination circuit being connected to receive said first plurality of logic input signals; and

(c) a third logic stage including:

means for receiving additional true and complementary logic signals;

a first logic section composed of a fifth transistor combination circuit having a plurality of enhancement field effect transistors coupled between a first output node and said second power source terminal, and a sixth transistor combination circuit having a plurality of depletion field effect transistors coupled between said first output node and said first power source terminal;

said fifth transistor combination circuit being responsive to said first output signal and said additional true signal; and

said sixth transistor combination circuit being responsive to said second plurality of logic input signals and said additional complementary signal.

4,631,425

LOGIC GATE CIRCUIT HAVING P- AND N- CHANNEL TRANSISTORS COUPLED IN PARALLEL

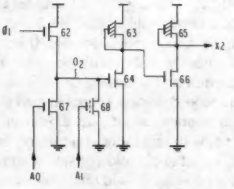
Shigeru Koshimaru, Tokyo, Japan, assignor to NEC, Tokyo, Japan

Filed Jan. 31, 1984, Ser. No. 575,596

Claims priority, application Japan, Jan. 31, 1983, 58-14197

Int. Cl.⁴ H03K *19/096*

U.S. Cl. 307—449 **8 Claims**



1. A logic circuit comprising a plurality of insulated-gate field effect transistors coupled in parallel with each other between an output node and a reference potential point, means for supplying electric charge to said output node, means for applying each one of a plurality of input signals to only a respective each one of the gate electrodes of said transistors, and means for deriving an output signal from said output node, said output signal taking either one of a first level and a second level, at least one of said transistors being a P-channel type transistor and another being an N-channel type transistor,

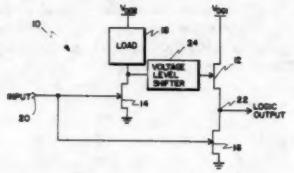
whereby said output signal takes said first level when at least one P-channel type transistor becomes conductive in response to said input signal applied thereto or at least one N-channel types becomes conductive in response to said input signal applied thereto and said output signal takes said second level when all of said P-channel type transistors and of said N-channel type transistors become non-conductive in response to said plurality of input signals, wherein said input signals may be supplied only in non-complementary form due to the provision of both P-channel and N-channel transistors.

4,631,426

DIGITAL CIRCUIT USING MESFETS

Roderick D. Nelson, Minneapolis, and Tho T. Vu, Fridley, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 27, 1984, Ser. No. 625,151
Int. Cl.[4] H03K *19/094, 19/20*
U.S. Cl. 307—450 **13 Claims**



1. An electrical circuit having an input for receiving a digital electrical signal of either a first or second value, a logic output node and a voltage reference point, and being adapted to connect to first and second voltage supplies, comprising:

means for inverting said digital electrical signal applied to said input to produce an inverted digital electrical signal, said inverting means including a first metal-semiconductor field effect transistor (MESFET) having a first source, a first drain and a first gate, wherein said first gate is directly electrically connected to said input, said first drain is electrically connected to said first voltage supply, said first source is directly electrically connected to said voltage reference point and said inverted digital electrical signal is generated at said first drain;

a second MESFET having a second source, second drain and a second gate, wherein said second MESFET is a depletion mode MESFET and said second drain is directly electrically connected to said second voltage supply;

a third MESFET having a third source, third drain and a third gate wherein said digital electrical signal applied to said input is also applied to said third gate, said third source is directly electrically connected to said voltage reference point and said third drain is directly electrically connected to said second source at said logic output node;

and wherein application of said digital electrical signal of said first value to said input will turn off said first and third MESFETs, and application of said digital electrical signal of said second value to said inupt will turn on said first and third MESFETs; and

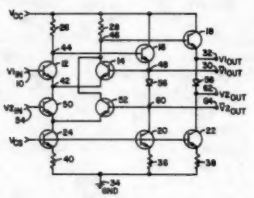
means for shifting the voltage level of said inverted digital signal to a lower voltage inverted digital signal, said lower voltage inverted digital signal being applied to said second gate and being sufficient to turn on said second MESFET when said digital electrical signal of said first value is applied to said input, and said lower voltage inverted digital signal being sufficient to turn off said second MESFET when said digital electrical signal of said second value is applied to said input.

4,631,427

ECL GATE CIRCUIT HAVING INTERNALLY GENERATED REFERENCE VOLTAGES

Nikhil C. Mazumder, San Jose, and David H. B. Yee, San Francisco, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 19, 1984, Ser. No. 672,768
Int. Cl.[4] H03K *19/086*
U.S. Cl. 307—455 **5 Claims**



1. An emitter coupled logic (ECL) gate circuit having internally generated reference voltages in which externally generated reference voltages are eliminated, said circuit comprising:

a first level of switching transistors being formed of a first input transistor and a first reference transistor, said first input transistor and said first reference transistor having their emitters coupled to a current source, said first input transistor having its base coupled to a first level input terminal, said first reference transistor having a base and collector;

first and second emitter follower transistors, said first emitter follower transistor being coupled to said first reference transistor, said second emitter follower transistor being coupled to said first input transistor, said second emitter follower transistor having its emitter coupled to the base of said first reference transistor;

at least a second level of switching transistors being formed of a second input transistor and a second reference transistor, said second level of switching transistors coupling said first level of switching transistors to said current source, said second input transistor and said second reference transistor having their emitters coupled to said current source, said second input transistor having its base coupled to a second level input terminal and its collector coupled to the emitters of said first level of switching transistors, said second reference transistor having a base and collector, said second reference transistor having its collector coupled to the collector of said first reference transistor; and

means, coupling the base of said first reference transistor to the base of said second reference transistor, for producing a second level reference voltage substantially proportional to a first level reference voltage at the base of said first reference transistor.

4,631,428

COMMUNICATION INTERFACE CONNECTING BINARY LOGIC UNIT THROUGH A TRINARY LOGIC TRANSMISSION CHANNEL

Dwight W. Grimes, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 26, 1984, Ser. No. 665,312
Int. Cl.[4] H03K *19/094*
U.S. Cl. 307—475 **24 Claims**

1. A communications interface including a first converter for performing a binary to binary conversion having a first binary control signal generator and a trinary driver and also a second converter for performing a trinary to binary conversion having a trinary receiver and a second binary control signal generator and said communications interface also having a transmission channel for transmitting trinary logic levels where said first converter performs at least one of the functions:

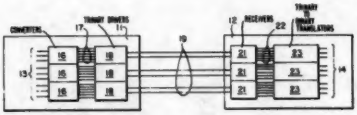
$(T_1=1)=\overline{A}B\overline{C}+ABC+A\overline{B}\overline{C}$

$(T_1=2)=\overline{A}B\overline{C}+A\overline{B}C$

$(T_1=0)=\overline{A}\overline{B}\overline{C}+\overline{A}BC+AB\overline{C}$

$(T_3=1)=A\overline{B}+\overline{A}BC$

$(T_3=2)=AB$



$(T_3=0)=\overline{A}\overline{B}+\overline{A}\overline{C}$

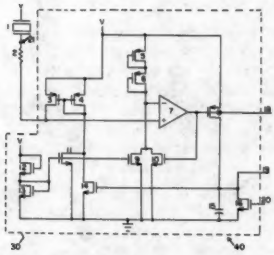
where outputs $T_1=1$, $T_1=2$, $T_1=0$, $T_3=1$, $T_3=2$, $T_3=0$ are are a first set of binary control signals generated by said first binary control signal generator and where A, B and C are the bit values of any three bits in adjacent bit positions selected from a first set of binary logic signals to be converted from binary to trinary.

4,631,429

HIGH VOLTAGE COMPRESSING INPUT BUFFER

G. Fred Riebeek, San Jose, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed Aug. 7, 1984, Ser. No. 638,434
Int. Cl.⁴ G06G 7/12
U.S. Cl. 307—490 **2 Claims**



1. A voltage compressing electronic circuit comprising:

a voltage source having a first lead connected to a first voltage source and a voltage source output lead for providing a large transient peak voltage;

a resistor having a first lead connected to said voltage source output lead of said input voltage source and having a second lead;

a means for comparing two current values having a first input lead connected to said second lead of said resistor, a second input lead, an output lead for providing an output signal, wherein said output signal is high when said first input lead carries a larger current than said second input lead, and wherein said output signal is low when said second input lead carries a larger current than said first input lead; and

a variable current source having a current output lead connected to said second input lead of said means for comparing, an input lead connected to said output lead of said means for comparing, and a reset input node,

wherein when said input lead receives a low voltage, the current on said current output lead increases in proportion with the time said input node receives a low voltage,

wherein said output lead of said means for comparing provides an output voltage having a selected mathematical relationship with the current provided by said current output lead, and

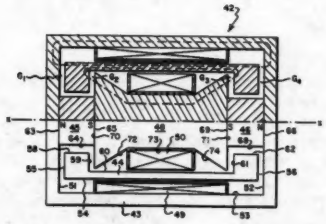
wherein said current source supplies no current when said reset input node receives a high voltage level.

4,631,430

LINEAR FORCE MOTOR

Richard A. Aubrecht, Orchard Park, N.Y., assignor to Moog Inc., East Aurora, N.Y.

Filed Jun. 17, 1985, Ser. No. 745,122
Int. Cl.⁴ H02K 41/00
U.S. Cl. 310—12 **23 Claims**



1. A linear force motor, comprising:

a body having an elongated chamber therewithin;

an armature arranged within said chamber for axial movement therealong relative to said body, said body and armature having surfaces cooperating to form first, second, third and fourth variable-reluctance axial air gaps therebetween, said first and second air gaps being arranged in one reciprocal pair such that the sum of their lengths is constant, said third and fourth air gaps being arranged in another reciprocal pair such that the sum of their lengths is constant, said first and third air gaps forming one parallel pair such that their lengths vary proportionally when said armature moves relative to said body, and said second and fourth air gaps forming another parallel pair such that their lengths vary proportionally when said armature moves relative to said body;

magnet means mounted on said body and operatively arranged to provide static flux in said air gaps; and

coil means arranged in said chamber and selectively energizable to produce control flux in one path which passes through said first and fourth air gaps but not said second and third air gaps, and in another path which passes through said second and third air gaps but not said first and fourth air gaps.

4,631,431

LINEAR MOTOR HAVING IMPROVED MAGNETIC CHARACTERISTICS

Stephen R. Viskochil, San Jose, Calif., assignor to Priam Corporation, San Jose, Calif.

Filed Jul. 30, 1984, Ser. No. 635,618
Int. Cl.⁴ H02K 41/02
U.S. Cl. 310—13 **7 Claims**

1. A linear motor and carriage assembly comprising

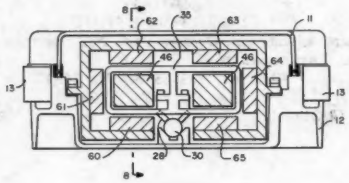
a first magnetic housing component including top and bottom surfaces, side surfaces, and one end surface, said end surface including integral therewith first and second magnetic center pieces, said end surface including an opening between said first and second magnetic center pieces,

a second magnetic housing component including an end plate for mating with said first magnetic housing compo-

nent, said end plate including integral therewith first and second magnetic center pieces which mate with said first and second magnetic center pieces of said first magnetic housing component,

first, second, and third magnets mounted to said top and bottom surfaces and one side surface of said housing in cooperative relationship with said first center piece,

fourth, fifth, and sixth magnets mounted to said top and



bottom surfaces and the other side surface of said housing in cooperative relationship with said second magnetic center piece, and

a carriage assembly extending through said opening in said first magnetic housing component with coil means positioned within said first and second magnetic housing components and coupled to said first and second magnetic center pieces whereby energization of said coil means moves said carriage assembly.

4,631,432

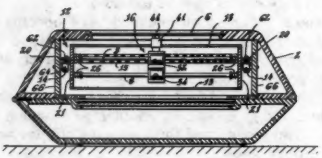
LINEAR MOTOR FACSIMILE MACHINE

Michael R. Thaler, Cheshire, Conn., assignor to Image Communications, Inc., New Milford, Conn.

Division of Ser. No. 390,210, Jun. 21, 1982, Pat. No. 4,476,496. This application Jul. 20, 1984, Ser. No. 632,731

Int. Cl.⁴ H02K *41/00*

U.S. Cl. 310—14 **9 Claims**



1. A linear motor comprising:

a movable element,

a plurality of electrical coils connected to said movable element and movable therewith,

a plurality of longitudinal members each having a plurality of magnetic elements spaced apart along its longitudinal axis, said longitudinal members guiding and supporting the entire weight of said movable element as it moves along said members, said electrical coils and magnetic elements being arranged so that when said electrical coils are energized magnetic interaction between said electrical coils and said magnetic elements causes said movable element to move along said longitudinal members,

wherein the longitudinal extent of individual magnetic elements is greater than the longitudinal extent of the electrical coil.

4,631,433

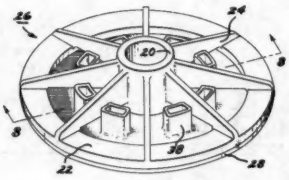
PLASTIC END SHIELD WITH THERMAL BARRIER FOR DYNAMOELECTRIC MACHINES

Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 6, 1985, Ser. No. 730,889

Int. Cl.⁴ H02K *5/08, 9/00*

U.S. Cl. 310—89 **20 Claims**



1. An end shield for a dynamoelectric machine of the type having a rotor assembly rotatably disposed in a housing, said end shield comprising:

an end plate comprising high strength plastic attached to said housing for providing structural support for one axial end of said rotor assembly and for maintaining a predetermined distance between the radially outermost portion of said rotor assembly and the radially innermost portion of said housing; and

a substantially solid thermal barrier comprising a plastic plate having both a low thermal conductivity and an ability to withstand heat in the range of approximately 150–200 degrees centigrade located adjacent to said end plate and disposed so as to thermally insulate said end plate from connective heat generated inside said housing.

4,631,434

INTERNAL COMBUSTION ENGINE STARTER HAVING LAMINATED PLATES SIMULTANEOUSLY FORMING THE SWITCH YOKE AND THE MOTOR YOKE

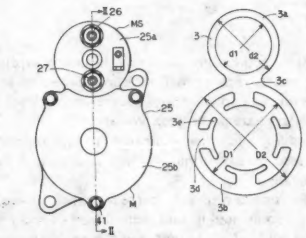
Ryuji Asaoka, Okazaki, and Yasuhiro Nagao, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 15, 1985, Ser. No. 723,285

Claims priority, application Japan, Apr. 18, 1984, 59-78900

Int. Cl.⁴ H02K *1/12*

U.S. Cl. 310—112 **11 Claims**



8. A starter for an internal combustion engine comprising:

a starter motor having a motor yoke; and

a magnet switch arranged in parallel with said starter motor and having a switch yoke,

wherein said motor yoke and switch yoke comprise a plurality of magnetic lamination plates having a section for forming said switch yoke, a second section for forming said motor yoke and a connecting portion connecting said first section with said second section,

said connection portion being a common magnetic path for

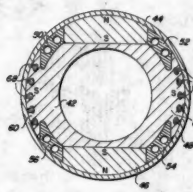
magnetic fluxes flowing through said switch yoke and said motor yoke.

4,631,435

CONSEQUENT POLE PERMANENT MAGNET ROTOR

Frederick B. McCarty, San Pedro, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 18, 1985, Ser. No. 810,967
Int. Cl.[4] H02K *21/14*
U.S. Cl. 310—156 17 Claims



1. A permanent magnet rotor for an electrical machine, comprising:

a ferromagnetic yoke;

a plurality of permanent magnets installed about the periphery of said ferromagnetic yoke to form permanent magnet poles, said ferromagnetic yoke having a plurality of radially outwardly extending projections disposed between said permanent magnets, said ferromagnetic projections being consequent ferromagnetic poles;

a plurality of damper bars fitted between said permanent magnet poles and said ferromagnetic poles, said damper bars made of a non-ferromagnetic, conducting material; and

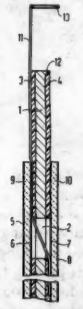
a retaining hoop placed in interference fit fashion over said permanent magnets, said ferromagnetic projections, and said damper bars.

4,631,436

TRANSDUCER PLATE FOR PIEZOELECTRIC TRANSDUCERS

Egon Edinger, Krailling, and Reinhart Schade, Olching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,890
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335431
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—322 7 Claims



1. In a transducer of the type in which a transducer plate includes first and second sides, first and second electrically-insulating adhesive layers are carried on the first and second sides, and first and second piezoceramic elements, each carrying electrodes on both of its sides, mounted on respective adhesive layers, and in which the piezoceramic elements are connected in parallel via the electrodes, the improvement wherein:

the transducer includes a passage extending therethrough from the first side to the second side; and

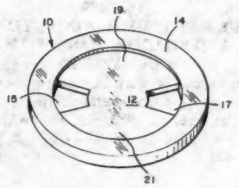
an electrical conductor extending through said passage parallel to and electrically contacting the respective electrode of each of the piezoceramic elements between that electrode and the respective adhesive layer.

4,631,437

STRESS COMPENSATED PIEZOELECTRIC CRYSTAL DEVICE

Arthur Ballato, Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 10, 1985, Ser. No. 690,358
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—369 3 Claims



1. A piezoelectric crystal comprising:

a piezoelectric resonant plate having a periphery and having a crystallographic force-frequency function, said crystallographic force-frequency function being zero for at least one null point on said periphery and the mathematical integral of said periphery being non-zero;

a supporting member positioned adjacent to but spaced separately from said plate; and

at least one supporting bridge coplanar with said plate and connected to a first position of said periphery, said first portion including at least one said null point, the angular span of said bridge being asymmetrically positioned about said null point and the mathematical integral of said crystallographic force-frequency function over said first portion being zero; and

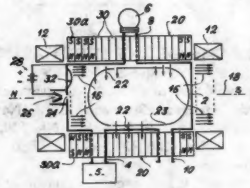
at least one second portion of said periphery hanging free.

4,631,438

MULTICHARGED ION SOURCE WITH SEVERAL ELECTRON CYCLOTRON RESONANCE ZONES

Bernard Jacquot, Saint Egreve, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 6, 1984, Ser. No. 678,821
Claims priority, application France, Dec. 7, 1983, 83 19572
Int. Cl.[4] H05H *00/00*
U.S. Cl. 313—359.1 5 Claims



1. A multicharged ion source comprising a sealed enclosure

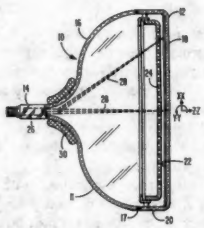
containing a gas for forming a plasma confined within said enclosure, means for producing within said enclosure a high frequency electromagnetic field, means for producing within said enclosure a group of axial and radial, local magnetic fields defining equimagnetic surfaces for confining said plasma produced by electron cyclotron resonance whereof the condition has been satisfied on one of them, said group having an axis of symmetry, means for extracting said ions through an orifice made on the wall of said enclosure and located on said axis of symmetry, said means for producing said local fields comprising first and second alternated magnetic bars arranged symmetrically around said enclosure and formed by several elementary magnets, the magnets of said first bars having polarities opposed to the polarities of the magnets of said second bars except that the terminal elementary magnets situated at the extraction orifice have the same polarity in order to reduce outside the volume occupied by the confined plasma, the amplitude of the local axial magnetic fields located in the vicinity of the extraction orifice, slightly upstream and downstream of said orifice, in n small zones located outside the axis of symmetry.

4,631,439

CATHODE-RAY TUBE HAVING CYLINDRICAL FACEPLATE AND SHADOW MASK WITH MINOR AXIS CURVATURES

Ralph J. D'Amato, and Richard H. Godfrey, both of Lancaster, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 25, 1983, Ser. No. 469,701
Int. Cl.[4] H01J *29/07*
U.S. Cl. 313—402 **4 Claims**



1. A shadow mask type cathode-ray tube including,

a cylindrical faceplate having a rectangular peripheral shape with two long sides and two short sides and having curvature along its minor axis which substantially parallels the two short sides and being substantially straight along its major axis which substantially parallels the two long sides;

an apertured shadow mask mounted within said tube, said mask having curvature along its minor axis and being substantially straight along its major axis, said mask being of a type of metal having a linear coefficient of thermal expansion of less than 3×10^{-6} $\Delta l/l/°C.$; and

said faceplate having a sufficiently larger linear coefficient of thermal expansion than that of said shadow mask to require correction for moving the shadow mask away from said faceplate during tube operation.

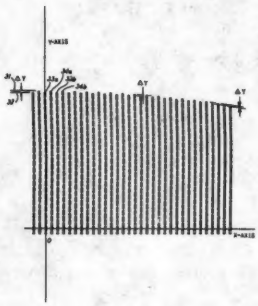
4,631,440

COLOR CATHODE RAY TUBE HAVING SMOOTH SCREEN EDGES

John D. Robbins, Seneca Falls, N.Y., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,368
Int. Cl.[4] H01J *29/07, 31/20*
U.S. Cl. 313—403 **7 Claims**

1. In a color CRT having a cathodoluminescent screen comprising an array of vertical phosphor stripes and an aperture mask positioned in spaced relationship to the screen, the mask comprising an array of slot-shaped apertures arranged in vertical columns corresponding to the vertical phosphor stripes, the distance from the center of one slot to the center of a vertically adjacent slot being designated as vertical pitch, the slots in adjacent columns being vertically displaced from one another, slots in non-adjacent columns lying in horizontal rows, and diagonally adjacent slots lying in adjacent rows, the



array defined by top, bottom, left and right edges, at least the top and bottom edges being curved,

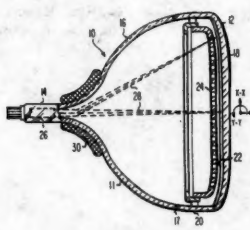
characterized in that every other column terminates in full length slots, and adjacent columns terminate in partial-length slots, and the vertical pitch varies uniformly between each row of adjacent slots to maintain the same number of slots in every other column, thereby to provide relatively smooth edges.

4,631,441

COLOR PICTURE TUBE HAVING IMPROVED LINE SCREEN

Albert M. Morrell, East Hempfield Township, Lancaster County, and Walter D. Masterton, Manheim Township, Lancaster County, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 14, 1985, Ser. No. 711,723
Int. Cl.[4] H01J *29/32, 29/07*
U.S. Cl. 313—408 **2 Claims**



1. In a color picture tube including a shadow mask mounted adjacent to a line screen, said shadow mask including a plurality of slit-shaped apertures therein located in columns, said line screen having a substantially rectangular periphery with two opposing long sides and two opposing short sides, a major axis of said screen being an axis passing through the center of the screen and centrally extending through the short sides, and a minor axis of said screen being an axis passing through the center of the screen and centrally extending through the long sides, and said screen including cathodoluminescent lines generally extending in the same direction as the minor axis, the improvement comprising

the cathodoluminescent lines of said screen, in plan front view, first increasing in curvature and then decreasing in curvature with increasing distance from the minor axis, to become approximately straight at the short sides of the screen, the curvature of the screen lines being concave facing the minor axis.

4,631,442
TEMPERATURE COMPENSATED ELECTRON GUN SYSTEM

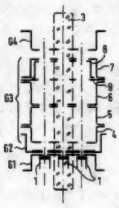
Hans Reule, Wendlingen, and Hartmut Ganzle, Plochingen, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 21, 1984, Ser. No. 653,753

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1983, 3334242

Int. Cl.⁴ H01J *29/50, 29/82*

U.S. Cl. 313—414 **18 Claims**



1. An electron-gun system for multi-cathode-ray tubes comprising:

one or more cathodes; and

at least second, third and fourth electrodes following said one or more cathodes and arranged one behind each other in the electron beam direction;

said third electrode having a substantially larger spatial expansion in said electron beam direction than said second and fourth electrodes and comprising at least a first electrode segment neighboring said second electrode and a second electrode segment neighboring said fourth electrode;

said second and fourth electrodes and said first and second electrode segments each consisting of materials having different temperature expansion coefficients, said second electrode segment consisting of a material having a smaller temperature expansion coefficient than the material of said fourth electrode, said first electrode segment consisting of a material having a temperature expansion coefficient either larger than or the same as that of the material of said second electrode.

4,631,443
MULTIBEAM ELECTRON GUN HAVING A FORMED TRANSITION MEMBER

Sigmund T. Villanyi, Lancaster Township, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

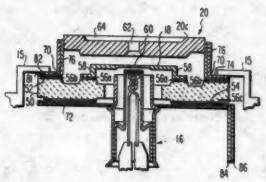
Filed Aug. 27, 1985, Ser. No. 769,734

Int. Cl.⁴ H01J *29/82, 29/50*

U.S. Cl. 313—417 **5 Claims**

1. In a multibeam electron gun for a cathode-ray tube comprising a plurality of cathode assemblies and at least two spaced, successive electrodes having aligned apertures therethrough for passage of a plurality of electron beams, said cathode assemblies and said electrodes being individually held in position from a common ceramic member, said ceramic member having a first major surface and an oppositely disposed second major surface with a metallized pattern formed on at least a portion of each major surface, said electrodes being attached to said first major surface and said cathode assemblies being attached to said second major surface, wherein the improvement comprises

a transition member disposed on said first major surface of said ceramic member, said transition member including a substantially flat portion attached to said metallized pattern and two upright portions substantially perpendicular to said flat portion, said upright portions being substantially parallel to each other, one of said electrodes being disposed between said upright portions and attached thereto, whereby said one electrode can be longitudinally spaced from the other electrode.



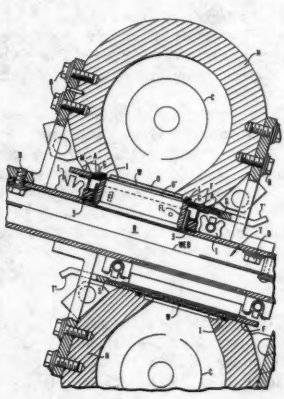
4,631,444
READILY ATTACHABLE AND DETACHABLE ELECTRON-BEAM PERMEABLE WINDOW ASSEMBLY

Richard N. Cheever, Acton, Mass., assignor to Tetra Pak Developpement SA, Lausanne, Switzerland

Continuation of Ser. No. 427,903, Sep. 29, 1982, abandoned. This application Feb. 20, 1986, Ser. No. 831,070

Int. Cl.⁴ H01J *33/04;* G21G *1/12*

U.S. Cl. 313—420 **5 Claims**



1. A readily attachable and detachable electron-beam permeable window assembly having, in combination, a frame defining an internal opening; a thin electron-beam permeable window overlying the opening and having a marginal region secured to one side of the frame and a peripheral region supported by the frame laterally inward of the marginal region and against which a peripheral sealing ring around an opening in an electron beam housing may be compressed; tab means extending laterally outward from the frame and fixed thereto to permit lateral insertion and removal of the frame from the sealing ring; flange means for supporting the frame on its side opposite the window, with the opening in the frame aligned with the opening in the housing, the flange means being positioned relative to the sealing ring to provide a space therebetween into which the frame may be laterally inserted or from which the frame may be laterally withdrawn by said tab means;

and locking means cooperative with the flange means and adapted when inactivated to permit the lateral insertion or withdrawal of the frame by the tab means into or from said space, and adapted when activated to cause locking force to be exerted against the flange means to seal the window to the sealing ring, said locking means comprising inflatable resilient means disposed adjacent the flange means.

4,631,445

MONOCHROME DISPLAY CATHODE RAY TUBE WITH LONG AFTER GLOW PHOSPHORS

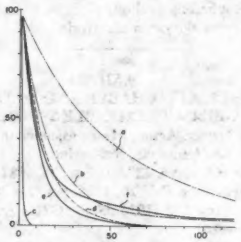
Takashi Hase; Hidemi Yoshida; Hideo Suzuki, and Morio Hayakawa, all of Odawara, Japan, assignors to Kasei Optonix, Ltd., Tokyo, Japan

Filed Mar. 23, 1984, Ser. No. 592,946

Claims priority, application Japan, Mar. 23, 1983, 58-40778[U]

Int. Cl.⁴ H01J 29/20; C09K 11/54

U.S. Cl. 313—467 **9 Claims**



1. A monochrome display cathode ray tube which comprises a white emitting fluorescent screen formed on a face plate facing an electron gun to emit cathode rays, said white emitting fluorescent screen comprising a phosphor mixture which comprises:

(a) from 40–70% by weight of a long after-glow red emitting europium-activated indium borate phosphor,

(b) from 10–40% by weight of a long after-glow green emitting manganese-activated zinc silicate phosphor, and

(c) from 10–50% by weight of a long after-glow blue emitting silver-activated zinc sulfide phosphor, which is a zinc sulfide phosphor co-activated by silver and at least one of gallium and indium and having the formula:

$$ZnS:Ag_{a'}X_{b'}Y_{c'}Z_{d'}$$

wherein X is at least one of Ga and In, Y is at least one of Cu and Au, Z is at least one element selected from the group consisting of Al, Cl, I, Br and F, and a', b', c' and d' represent from 5×10^{-4} to 10^{-1}% by weight, from 10^{-6} to 5×10^{-1}% by weight, at most 2×10^{-2}% by weight and from 5×10^{-6} to 5×10^{-2}% by weight, respectively.

4,631,446

SINGLE-ENDED HIGH INTENSITY DISCHARGE LAMP

George J. English, Reading; Peter R. Gagnon, Georgetown, and Stephen J. Leadvaro, Salem, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 4, 1984, Ser. No. 608,310

Int. Cl.⁴ H01J 61/30, 61/36

U.S. Cl. 313—634 **10 Claims**

1. A single-ended low wattage high intensity discharge lamp comprising:

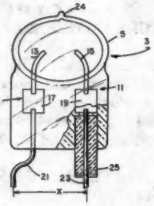
a quartz envelope having a "pinch" seal at one end;

a fill gas within said envelope;

a pair of spaced electrodes within said envelope and sealed in said "pinch" seal;

a pair of spaced electrical conductors sealed into said "pinch" seal and coupled respectively to said electrodes;

a tubular sleeve of electrically insulating material having a coefficient of expansion substantially similar to the coefficient of expansion of said quartz envelope, said sleeve being telescoped over a substantial external portion of at



least one of said pair of spaced electrical conductors and having one end fused into said "pinch" seal of said quartz envelope, said sleeve substantially inhibiting arcing between said pair of spaced electrical conductors external of said envelope resulting in a "cold start" voltage for said lamp of greater than or about 2 KV and a "hot-restrike" voltage of greater than or about 5 KV.

4,631,447

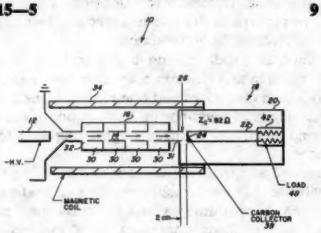
IREB CONVERTER TO AC PULSES

Moshe Friedman, Washington, D.C., and Victor Serlin, Springfield, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 17, 1984, Ser. No. 661,838

Int. Cl.⁴ H01J 25/02

U.S. Cl. 315—5 **9 Claims**



1. A device for converting the energy of an intense relativistic electron beam having a current between 1 kiloamp and 1 megaamp into high power AC electrical pulses comprising:

a longitudinally-running drift tube with a first and second ends;

means for generating an intense relativistic electron beam (IREB) and injecting said IREB to propagate along a path in said drift tube from said first end thereof;

means for modulating said IREB with at least one frequency to obtain longitudinally spaced bunches of electrons in said drift tube in accordance therewith;

coaxial means including an outer conductor and a center conductor with an end of said center conductor disposed across the second end of said drift tube in the path of said IREB; and

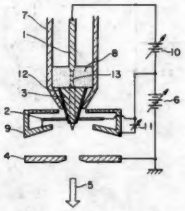
a gap disposed between the second end of said drift tube and the end of said center conductor;

wherein said coaxial means in combination with said gap acts to convert the kinetic energy of the electron bunches in said drift tube into electrical energy for propagation along said coaxial means.

4,631,448
ION SOURCE

Hifumi Tamura, Hachioji, Japan; Clay Shepherd, Los Altos, Calif.; Toru Ishitani, Sayama, and Kaoru Umemura, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1984, Ser. No. 578,206
Claims priority, application Japan, Mar. 9, 1983, 58-37394
Int. Cl.[4] H01J 27/22
U.S. Cl. 315—111.81 20 Claims



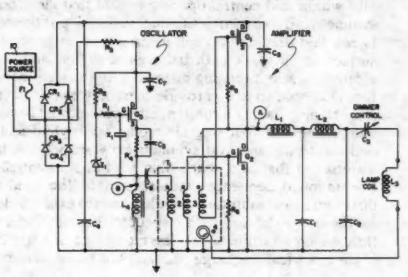
1. An ion source comprising:
an emitter chip having a sharp tip;
an ion source material holding part made of a material having a high melting point and provided with an aperture in a bottom wall, said emitter chip being disposed within said ion source material holding part in a coaxial manner so that said tip of said emitter chip passes through said aperture;
means for emitting an electron beam;
a power supply for heating said electron beam emitting means;
an extraction electrode adapted to form an electric field for extracting an ion beam, around said tip of said emitter chip;
an ion extracting power supply for applying a high voltage between said extraction electrode and said emitter chip; and
an ion source material reservoir placed inside the ion source material holding part and being electrically conductive and adapted to be electrically connected to the emitter chip, the ion source material reservoir and the emitter chip forming a space for loading an ion source material and forming a slit for feeding a molten ion source material to the tip of the emitter chip.

4,631,449
INTEGRAL CRYSTAL-CONTROLLED LINE-VOLTAGE BALLAST FOR COMPACT RF FLUORESCENT LAMPS

Philip H. Peters, Jr., Greenwich, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 6, 1984, Ser. No. 638,166
Int. Cl.[4] H05B 37/00
U.S. Cl. 315—205 19 Claims

1. A ballast circuit for a fluorescent lamp comprising:
a rectifier-filter means adapted for coupling to an AC power source to generate a DC voltage,
an oscillator circuit coupled to said DC voltage for developing an RF oscillator signal,
switching signal generating means response to said oscillator signal to develop concurrent oppositely phased switching signals at the frequency of said oscillator signal,
series connected power transistors having inputs coupled to said switching signals, said transistors having a common output, a fluorescent lamp energization coil coupled to said common output,
said switching signal generating means including feedback means for regeneratively feeding back a portion of the current in said coil to aid in switching said power transistors whereby said transistors develop an RF power output signal at said common output to drive said coil, said power output signal being in the form of a square wave, and

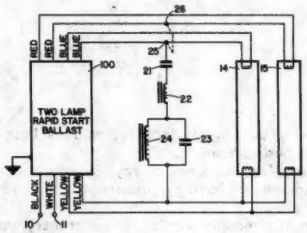


a filter circuit coupled intermediate said common output and said coil to transform said square wave to a sinusoidal wave.

4,631,450
BALLAST ADAPTOR FOR IMPROVING OPERATION OF FLUORESCENT LAMPS

James L. Lagree, Wilkinsburg, and Robert T. Elms, Monroeville, both of Pa., assignors to North American Philips Lighting Corporation, New York, N.Y.

Filed Dec. 28, 1983, Ser. No. 566,240
Int. Cl.[4] H05B 37/00
U.S. Cl. 315—244 20 Claims



1. A ballast adaptor for connection to the terminals of a first type of discharge lamp so as to adapt said first type of discharge lamp for operation with a ballast device designed to operate with a second type of discharge lamp similar to the first type of lamp but having significantly different starting and operating characteristics, said adaptor comprising a series-parallel LC network adapted to produce an odd order harmonic current of an AC supply voltage, said series-parallel LC network including a series LC circuit connected to a parallel LC circuit.

4,631,451
BLAST GAP IGNITION SYSTEM

Richard W. Anderson, Ann Arbor; Joseph R. Asik, Bloomfield Hills; Richard C. Ronzi, Birmingham, and Aladar O. Simko, Dearborn Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 553,210, Nov. 18, 1983, abandoned. This application Jun. 24, 1985, Ser. No. 748,137
Int. Cl.[4] H05B 37/02, 39/04, 41/36
U.S. Cl. 315—209 R 7 Claims

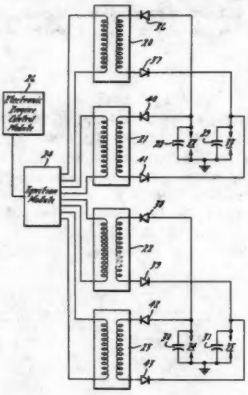
1. An ignition system including a spark coupled to a supplemental spark energy circuit, said spark plug having a ring air gap and surface spark path including:

a first electrode having a ring shape defining a central opening;

a second substantially cylindrical electrode positioned coaxially within said central opening of said first electrode;

a symmetrically shaped insulating material positioned between said first and second electrodes so as to provide a surface for a spark path between said first and second electrodes, said insulating material being spaced from said first electrode so as to provide therebetween an air gap;

said spark plug having a substantially symmetrical firing end comprising said first ring electrode, said cylindrical second electrode, and said symmetrically shaped insulating material so that said spark plug (a) has substantially no orientation dependency with respect to the fluid flow direction in a combustion cylinder, and (b) exhibits electrical discharge stability with respect to the in-cylinder fluid flow which is manifested by less elongation and stretching of the electrical discharge path and less subsequent reignition of the original discharge path resulting in improved combustion stability;



said supplemental spark energy circuit including:

an ignition coil having a primary winding and a secondary winding;

an ignition module coupled to said primary winding;

a supplementary spark plug energy module coupled to said secondary winding for providing an electrical output to be applied in combination with the electrical output of said secondary winding to said ring gap spark plug to produce a spark of increased magnitude and duration with increased electrical discharge stability that results in higher spark energy density with the combination of said ring air gap and surface spark path and improved ignitability of dilute combustible mixtures;

a distributor coupled to said secondary winding; and

a plurality of spark plugs selectively coupled to said distributor.

4,631,452

APPARATUS AND METHOD FOR GENERATING A PLURALITY OF ELECTRIC DISCHARGES

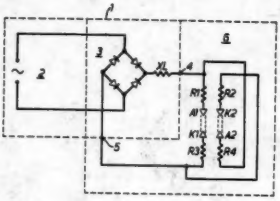
John E. Harry, Oakham, England, assignor to Loughborough Consultants Limited, Loughborough, England

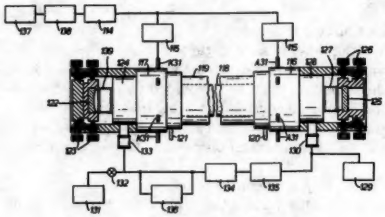
Filed Sep. 28, 1982, Ser. No. 425,752

Int. Cl.⁴ H01J *11/04, 13/48, 15/04, 17/36;* **H05B** *37/00*

U.S. Cl. 315—334 **14 Claims**

1. A gas laser including a discharge tube, optical path means for providing an optical path in the discharge tube, a power supply, a first set of at least two adjacent electrodes extending into the discharge tube and a like number of first impedances each of which connects one electrode of the first set to one side of the power supply, and a second set of at least two adjacent electrodes spaced along the optical path from the first set and extending into the discharge tube and a like number of second impedances each of which connects one electrode of the second set to an opposite side of the power supply, whereby stable electric glow discharges which coalesce and extend along the





optical path are generated between the respective electrodes of the first and second sets to provide a stable volume of electric discharge in the optical path of the laser for exciting the laser.

5. An apparatus as claimed in claim 1 in which the impedances are each above a minimum value of the same order of magnitude as the impedance of the discharge path during stabilized operation.

4,631,453

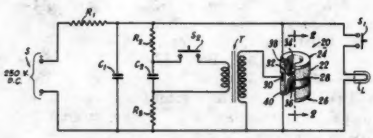
TRIGGERABLE CERAMIC GAS TUBE VOLTAGE BREAKDOWN DEVICE

Alwyn A. DeSouza, and Hans W. Oertel, both of Goleta, Calif., assignors to Joslyn Mfg. and Supply Co., Chicago, Ill.

Filed Aug. 29, 1983, Ser. No. 526,988

Int. Cl.⁴ H01J *11/04, 13/48, 15/04;* **H05B** *37/00*

U.S. Cl. 315—340 **29 Claims**



1. A hermetically sealed triggerable gas tube voltage breakdown device comprising

a first gap electrode,

a second gap electrode, said first and second gap electrodes being the only gap electrodes in said device,

an electrode gap formed between said gap electrodes, said electrode gap being the only electrode gap in said device,

an elongated ceramic insulating spacer disposed between said gap electrodes and enclosing said electrode gap, and

trigger electrode means, physically separated from the electrically insulated from both of said gap electrodes and adapted to receive a trigger voltage signal other than the

voltage applied across said gap electrodes, for increasing the electrical field intensity in the region of said electrode gap in response to said trigger voltage signal, said trigger electrode means being entirely exteriorly disposed about the outer periphery of said insulating spacer and being axially aligned along the length of said insulating spacer with said region of said electrode gap and being electrically insulated from said electrode gap by said insulating spacer,

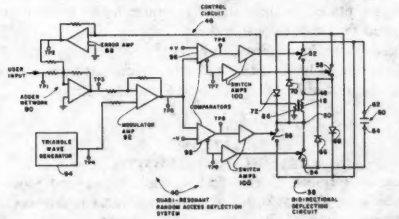
said spacer including means disposed about the region of said electrode gap for enabling the electric field intensity in said region to be increased in response to the application of said trigger voltage signal to said trigger electrode, said enabling means comprising a thin wall portion of said insulating spacer disposed at least partially about the region of said electrode gap, said thin wall portion having a wall thickness in the range of from about 0.015 inch to about 0.030 inch.

4,631,454

QUASI-RESONANT RANDOM ACCESS DEFLECTION SYSTEM FOR A CALLIGRAPHIC DISPLAY MONITOR

Paul T. Ballard, 2409 Westlawn Dr., Kettering, Ohio 45440

Filed Mar. 25, 1985, Ser. No. 715,519
Int. Cl.[4] H01J *29/70*
U.S. Cl. 315—408 **26 Claims**



1. In a video display apparatus, such as a calligraphic display monitor, having means for generating an electron beam and a deflection yoke operable for magnetically deflecting said beam, said deflection yoke including first and second opposite terminals, a quasi-resonant random access deflection system comprising:

(a) a resonant deflection circuit connected to said deflection yoke and being actuable to cause selected movement of said beam along a bidirectional path and stopping of said beam at any position along said bidirectional path; and

(b) a control circuit coupled to said resonant deflection circuit and being operable to actuate said resonant deflection circuit;

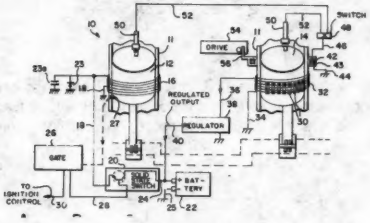
(c) said resonant deflection circuit including first, second, third and fourth switches and a capacitor having a pair of first and second opposite plates, said first and second switches being connected respectively to said first and second terminals of said deflection yoke and to said first and second plates of said capacitor, and said third and fourth switches being connected respectively to said second and first terminals of said deflection yoke and to said first and second plates of said capacitor.

4,631,455

METHOD AND APPARATUS FOR CONVERTING A CONVENTIONAL INTERNAL COMBUSTION ENGINE INTO A HIGH SPEED ELECTRIC MOTOR AND GENERATOR

Howard A. Taishoff, 105 Oxford Blvd., Great Neck, N.Y. 11023

Continuation-in-part of Ser. No. 551,849, Nov. 15, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 697,690
Int. Cl.[4] H02K *33/12*
U.S. Cl. 318—37 **14 Claims**



1. Apparatus for converting a conventional internal combustion engine into a high speed electric motor wherein the engine is capable of switching between heat operation and propulsion by electricity including in combination a sleeve mounted in the engine block, a conventional piston of ferromagnetic material mechanically connected to a conventional crankshaft for reciprocal movement in said sleeve, a low voltage high current coil solenoidally wound around said sleeve in close proximity thereto, said coil extending a relatively short distance along the longitudinal length of said sleeve and being positioned thereon so as to be substantially centrally disposed with respect to the linear path swept by said piston, solid state switch means electrically connected between said coil and a battery, and means for turning on said solid state switch means and turning off heat operation, the former-mentioned means responsive to battery status and power requirements whereby when heat operation is shut off, the turning on of said solid state switch means applies electric current to said coil such that current is sent into said coil when said piston is moving in a direction relatively towards said coil, and current to said coil is interrupted when said piston is moving in a direction relatively away from said coil whereby magnetic interaction between said piston and the magnetic field induced around said coil drives said piston in a direction complementary with its motion so that the engine runs as either electrically propelled or heat operated.

4,631,456

INERTIAL ENERGY STORAGE DEVICE AND SYNCHRONOUS ROTARY ELECTRICAL MACHINE FOR USE THEREIN

Robert D. Drescher, Cambridge; David B. Eisenhaure, Hull; Richard L. Hockney, Saugus, all of Mass.; Bruce G. Johnson, Sacramento, Calif.; Emery St. George, Jr., Duxbury, and David C. Whipple, Cohasset, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Continuation of Ser. No. 360,410, Mar. 22, 1982, abandoned. This application Sep. 17, 1984, Ser. No. 651,071
Int. Cl.[4] H02K *47/14, 7/02*
U.S. Cl. 318—140 **47 Claims**

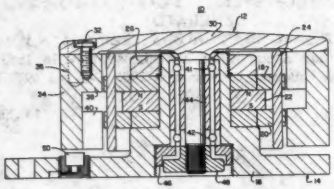
1. A synchronous rotary electrical machine for bidirectional conversion between mechanical and electrical energy comprising:

a stator having two axially spaced sets of circumferentially spaced teeth;

axially polarized field excitation means disposed on said stator to provide an axially polarized magnetic field;

a rotor having a plurality of circumferentially spaced magnetic poles facing said stator teeth and magnetic means interconnecting adjacent rotor poles; and

stator windings distinct from said field excitation means and including a plurality of coils, each of which surrounds,



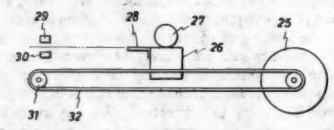
from one of said sets, at least one tooth which is covered by a rotor pole and, from the other of said sets, at least one tooth which is not simultaneously covered by a pole.

4,631,457

METHOD OF LEADING A MOVING BODY DRIVEN BY A DIRECT CURRENT BRUSHLESS MOTOR TO A STARTING POSITION

Jiro Tanuma; Takao Uchida, and Kunihal Hayashi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1984, Ser. No. 666,047
Claims priority, application Japan, Nov. 1, 1983, 58-203626
Int. Cl.[4] H02P *6/02*; H02K *29/12*
U.S. Cl. 318—254 **3 Claims**



1. An apparatus for moving a movable body comprising:

a direct current brushless motor comprising a stator including a plurality of armature coils secured on a stator yoke through a substrate; a disc-like magnet having N and S poles arranged alternately in a circumferential direction to confront the armature coils, and a rotatable rotor having a rim and a speed-detecting slit on the rim;

means for applying an electric current corresponding to a magnetic pole of the magnet to each armature coil to obtain rotating power for the motor;

a speed detector responsive to the speed detecting slit of the rotor for generating a frequency voltage pulse proportional to motor speed;

counter means for counting the frequency pulses from said speed detector;

means for changing excitation phases after every definite number of pulses counted;

stopper means for stopping the movable body at a predetermined position at or close to the maximum torque of the motor, whereby impingement of the movable body against the stopper means stops rotation of the rotor;

means for resetting the counter means to a count number corresponding to said predetermined position; and

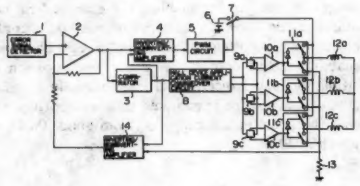
means for rotating the rotor in a reverse direction to locate the rotor at a stable stop position and position the motor at a starting point.

4,631,458

CURRENT CONTROL TYPE CIRCUIT FOR BRUSHLESS MOTOR

Tokinori Furuichi, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 25, 1985, Ser. No. 791,344
Claims priority, application Japan, Oct. 26, 1984, 59-223953
Int. Cl.[4] H02P *6/02*
U.S. Cl. 318—254 **3 Claims**



1. A driver circuit for a motor having stator coils comprising:

error detector means for detecting the rotation phase of the motor and generating an error signal;

amplifier means for amplifying said error signal;

control signal generator means for generating an interrupted control signal on the basis of the amplified error signal of said amplifier means;

switch means for supplying an interrupted current to said stator coils in response to the control signal and having a polarity corresponding to the polarity of said error signal;

current detector means for generating a detected voltage dependent upon the magnitude of the interrupted current supplied to said stator coils, said current detector means being placed in the path of the interrupted current supplied said stator coils; and

negative feedback means for negatively feeding back the detected voltage with a polarity dependent upon the polarity of said error signal to said amplifier means.

4,631,459

BRUSHLESS DC MOTOR

Souichirou Fujioka, Saksi; Toshio Inaji, Mino, and Susumu Yamamoto, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 3, 1985, Ser. No. 804,253
Claims priority, application Japan, Dec. 25, 1984, 59-277165; Jul. 2, 1985, 60-145586; Sep. 30, 1985, 60-217013
Int. Cl.[4] H02P *6/02*
U.S. Cl. 318—254 **17 Claims**

1. A brushless DC motor comprising:

a permanent magnet rotor magnetized to have 2n poles (n is a positive integer);

a plurality of stator coils mounted on a stator;

a position detecting arithmetic circuit for obtaining a rotating position signal of said permanent magnet rotor by processing a counter electromotive force generated in each of said plurality of stator coils;

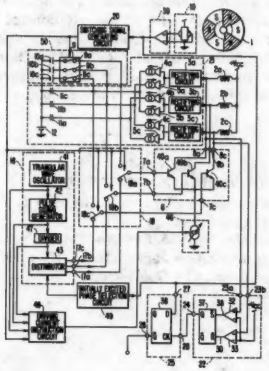
a coil driving circuit for energizing said plurality of stator coils;

a starting circuit for controlling said coil driving circuit to rotate said permanent magnet rotor by forcibly energizing said plurality of stator coils sequentially during a starting of said motor;

a position detecting means composed for detecting at least one specific rotating position of said rotor; and

a driving status switching circuit which allows said coil driving circuit to be responsive to an output signal of said starting circuit until said position detecting means detects

said specific rotating position, and to an output signal of said position detecting arithmetic circuit after said position detecting means detects said specific rotating position.



4,631,460

DRIVING DEVICE HAVING A REVERSIBLE ELECTRIC MOTOR

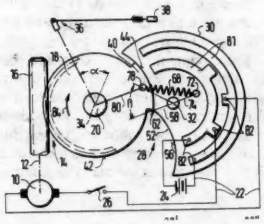
Siegfried Reichmann, Rheinau-Honau, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 25, 1985, Ser. No. 792,830

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1984, 3440261

Int. Cl.[4] H01H *3/16*; B60R *27/00*

U.S. Cl. 318—280 **14 Claims**



1. A driving device for a control member of a functional unit, comprising a reversible electric motor, switching means connected between electric power source terminals and said electric motor to reverse direction of rotation of the latter, reduction gears having an input gear connected to a driving shaft of said electric motor and an output gear linked to said control member to move the same between two working positions, a stop member arranged for joint rotation with said output gear, said switching means including a contact disc supported for rotation in a plane of rotation of said stop member, said contact disc being provided with two stop surfaces cooperating with said stop member, and means for coupling said output gear with said contact disc to rotate the latter in one direction into a first angular position in which one of said stop surfaces engages said stop member and said control member is moved into one working position, and in opposite direction into another angular position in which the other stop surface engages said stop member and said control member is moved into an opposite working position.

4,631,461

DEVICE FOR ELECTRICALLY CONTROLLING THE POSITION OF A SLIDING OPENING PANEL OF A MOTOR VEHICLE

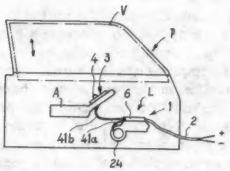
Michel Peugeot, Seloncourt, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed Dec. 24, 1984, Ser. No. 685,661

Claims priority, application France, Dec. 23, 1983, 83 20722

Int. Cl.[4] H02P *1/00*

U.S. Cl. 318—280 **11 Claims**



1. A device for electrically controlling the position of a sliding opening panel of a motor vehicle, said device being connected to a power supply in series with a control circuit of a driving motor for shifting the panel between a closing position and an opening position said device comprising a series of conductors which are electrically connected in parallel and mechanically disposed in adjacent positions relative to one another, said conductors materializing a particular position that the panel is capable of occupying in its travel between said closing position and said opening position, all the conductors except one being connected together by a first of their ends so as to form a first terminal of said control device, a setting slider having an adjustable position which sets the position that the panel must reach and which is operative to selectively break the connection of said first ends, all the conductors having second ends opposed to said first ends, a copying slider comprising a bridge element associated with said second ends and constituting a second terminal of said control device and capable of selectively connecting together the second ends of pairs of adjacent conductors, said copying slider being adapted to be connected to move with said panel.

4,631,462

SYSTEM FOR CONTROLLING THE SPEED OF AN ELECTRIC MOTOR

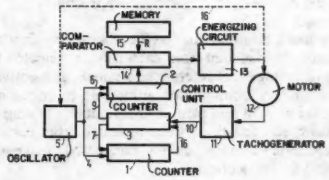
Willem J. A. Geven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 4, 1986, Ser. No. 825,837

Claims priority, application Netherlands, Sep. 11, 1985, 8502479

Int. Cl.[4] G05B *19/28*

U.S. Cl. 318—318 **10 Claims**



1. A system for controlling the speed of an electric motor controlled by a control signal via an energising circuit, comprising:

an oscillator which supplies a first pulse train whose frequency depends on the desired motor speed,

a first counter having a clock-pulse input connected to the

oscillator output and which counts up to a predetermined value and stops counting when said value is reached,

a second counter having a clock-pulse input connected to the oscillator output and which starts counting as soon as the first counter supplies a signal when said predetermined value is reached,

means for producing a second pulse train whose frequency depends on the motor speed, said second pulse train being applied to the first counter to re-start said counter when a pulse appears to count from a specific initial count up to said predetermined value and which pulse train is applied to the second counter, and

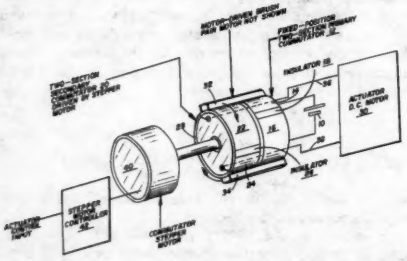
decoding means to which the output signals of the second counter are applied to generate a control signal for the energising circuit, characterized in that the second counter comprises a bidirectional counter which counts in one direction in the said interval between the instant at which the first counter reaches the predetermined value and the occurrence of a pulse in the second pulse train and which counts in the other direction in the intermediate intervals and in that the decoding means include a comparator to which a reference value is applied in addition to the output signals of the second counter and which supplies a signal of a first level if the reference value exceeds the count of the second counter and a signal of a second level if the reference value is smaller than the count of the second counter.

4,631,463

LINEAR CONTROLLER FOR ELECTROCHEMICAL DEVICE AND METHOD

John F. Klinchuch, Orange, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 14, 1985, Ser. No. 701,892
Int. Cl.[4] H02P 7/00
U.S. Cl. 318—558 **9 Claims**



1. An apparatus for generating and linearly controlling periodic bipolar drive signals from a DC power source having supply voltage and reference terminals to drive an electromechanical device, said apparatus comprising:

a base;

a primary commutator having conductive first and second sections insulated from each other connected to said supply voltage and reference terminals, respectively;

a secondary commutator adjustable in rotational position coaxial with said primary commutator having conductive third and fourth sections insulated from each other, said electromechanical device connected between said third and fourth sections;

means attached to said base insulatively supporting said primary commutator;

a pair of diametrically opposed conductive brushes, each brush for electrically connecting one section of said primary commutator to one positionally related section of said secondary commutator;

means attached to said base for insulatively supporting and rotating at a given fixed rate said pair of brushes in electrical contact with said sections of said primary and secondary commutators; and

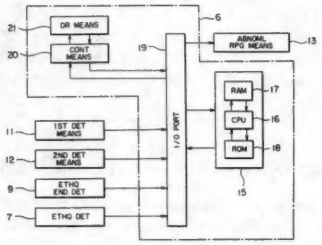
means for insulatively supporting and adjustably setting the rotational position of said secondary commutator relative to said primary commutator to linearly control the periodic bipolar drive signal applied to said electromechanical device corresponding to said rotational position of said secondary commutator as said pair of brushes rotates simultaneously about said primary and secondary commutators.

4,631,464

INDUSTRIAL ROBOT SYSTEM

Hisao Kato, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1985, Ser. No. 784,093
Claims priority, application Japan, Oct. 5, 1984, 59-209407
Int. Cl.[4] G05B 9/02
U.S. Cl. 318—563 **3 Claims**



1. An industrial robot system comprising:

a robot disposed in an environment having peripheral equipment and operable under program control of a control unit to shift between normal job mode operation and earthquake mode operation,

earthquake detection means for detecting earth vibration and for producing a first detection signal when the vibration exceeds a predetermined value,

earthquake mode control means disposed between said earthquake detection means and said control unit for generating a control output in response to the first detection signal to interrupt the normal job mode operation of said robot and shift said robot to the earthquake mode operation, said robot being moved to a position away from the peripheral equipment under the earthquake mode operation.

4,631,465

TOOL DISPLAY SYSTEM OF AUTOMATIC TOOL CHANGING APPARATUS

Hiroomi Fukuyama, Hachioji; Kiyoshi Hattori, Shiroyama, and Yoshihiro Nakashima, Machida, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

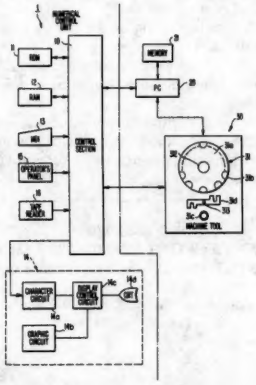
PCT No. PCT/JP85/00048, § 371 Date Jul. 31, 1985, § 102(e) Date Jul. 31, 1985, PCT Pub. No. WO85/03470, PCT Pub. Date Aug. 15, 1985
PCT Filed Feb. 6, 1985, Ser. No. 766,839
Claims priority, application Japan, Feb. 6, 1984, 59-019564
Int. Cl.[4] G05B 23/02
U.S. Cl. 318—565 **5 Claims**

1. A tool display system of an automatic tool changing apparatus having a machine tool equipped with an automatic tool changing apparatus, a numerical control unit for executing numerical control of the machine tool, and a programmable controller for executing sequential control of the machine tool on the basis of a control signal from said numerical control unit, said tool display system comprising:

a tool magazine provided on the automatic tool changing apparatus;

a plurality of pots, provided on said tool magazine, for accommodating tools;

a memory, operatively connected to the machine tool, for storing the position of each of said plurality of pots and for



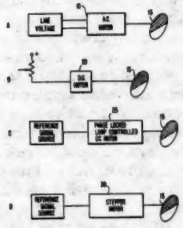
storing position information for tools accommodated at the pot positions; and

a display unit, operatively connected to the numerical control unit, for displaying pot positions, the pot positions changing due to movement of said tool magazine, and said tools accommodated at the pot positions, on the basis of said position information stored in said memory.

4,631,466
PHASE LOCKED STEPPER MOTOR CONTROLLED LIGHT CHOPPER

Gary W. Sherwin, South Huntingdon Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1985, Ser. No. 727,156
Int. Cl.[4] H02P 8/00
U.S. Cl. 318—696 **6 Claims**



1. A phase locked loop stepper motor controlled light chopper, comprising:

comparator and signal generation means, operatively connected to receive a reference signal and a comparison signal, for generating signal pulses in accordance with a difference between phases of said reference signal and said comparison signal;

counter means, operatively connected to receive the signal pulses, for counting the signal pulses and for providing count signals varying in accordance with the counted number of the signal pulses;

divider means, operatively connected to receive a one of the count signals, for counting a predetermined number of the one of the count signals and for providing the comparison signal each time the predetermined number of count signals is counted;

driver means for generating a four phase signal having eight states varying in response to the count signals;

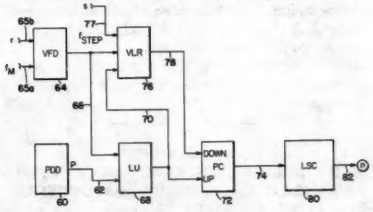
a stepper motor having a drive shaft rotated in response to the four phase signal ; and

a chopper wheel mounted on and rotated by the drive shaft.

4,631,467
ESCALATOR PASSENGER FLOW CONTROL

Dietrich E. Herrmann, Vechelde, and Detlev Abraham, Berlin, both of Fed. Rep. of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed May 28, 1985, Ser. No. 738,336
Int. Cl.[4] H02P 5/40
U.S. Cl. 318—798 **4 Claims**



1. A circuit for providing a load signal (74) indicative of the number of passengers on an escalator, comprising:

means (66) for providing a step speed signal (f_{step}) indicative of the speed of the escalator;

means (77) for providing a step number signal (s) indicative of the number of steps in an escalator run;

sensor means (60) for providing an entry signal (P) indicative of the entry of a passenger onto the escalator;

variable length shift register means (76) for providing a down signal (78) in response to the entry signal (p) having moved through the shift register, wherein the length of the register is determined by the step number signal (s) and the rate of the register is determined by the step speed signal (f_{step}); and

up/down counter means (72) for incrementing the load signal (74) in response to each occurrence of the entry signal and for decrementing the load signal in response to each occurrence of the down signal (78).

4,631,468
BATTERY CHARGING CIRCUIT FOR ELECTRONIC APPARATUS

Masaharu Satoh, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 26, 1984, Ser. No. 604,009
Claims priority, application Japan, Apr. 30, 1983, 58-77815
Int. Cl.[4] H02J 7/04
U.S. Cl. 320—14 **5 Claims**

1. A charging circuit for charging a battery from an external power supply and supplying power to a load comprising:

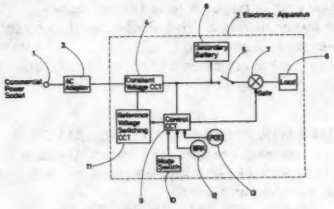
first charging means provided for interrupting the supply of power from said external power supply to the load to rapidly charge a secondary battery from said external power supply in a rapid charge mode;

second charging means provided for enabling the supply of power to said load from said external power supply to

charge said secondary battery in a trickle charge mode; and

control means for selectively activating said first charging means or said second charging means, said control means including,

a constant voltage circuit for developing a constant voltage,



a reference voltage circuit for generating two kinds of reference signals,

a mode switch for selectively switching between said first charging means and said second charging means,

a gate coupled to said load, and

a control circuit responsive to the switching of said mode switch for controlling said reference voltage circuit and said gate.

4,631,469

DEVICE FOR DRIVING ELECTRICAL CURRENT GENERATOR FOR USE IN MOTORCYCLE

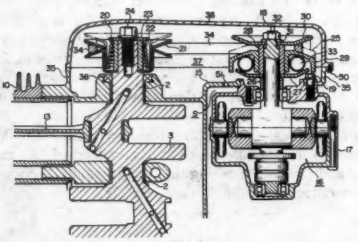
Masaharu Tsuboi, and Kuniaki Watanabe, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 367,517, Apr. 12, 1982, abandoned. This application Oct. 17, 1984, Ser. No. 661,881

Claims priority, application Japan, Apr. 14, 1981, 56-52686[U]; Apr. 14, 1981, 56-55006

Int. Cl.⁴ H02P *15/00*

U.S. Cl. 322—42 **9 Claims**



1. A device for driving an electrical current generator for use in a motorcycle comprising:

(a) an engine unit for housing an engine of said motorcycle;

(b) said electrical current generator provided separately from and mounted outside of said engine unit;

(c) power transmission means provided between one end of an output shaft of said engine and one end of a rotary shaft of said generator and comprising:

a V-belt;

a first pulley mounted on one of said one ends of said output shaft and said rotary shaft; and

a second pulley mounted on the other of said one end, said second pulley including means for increasing a rotational speed ratio of said rotary shaft to said output shaft during low rotation range of said engine and decreasing said ratio during high rotation range thereof, said V-belt being mounted between said first pulley and said second pulley, said engine unit and said electrical current generator being provided at the same side of said power transmission means;

said power transmission means further comprising;

an endless transmission member;

a planetary gear and clutch mechanism connected to said one end of said output shaft;

a first pulley mounted on said planetary gear and clutch mechanism, and

a second pulley mounted on said one end of said rotary shaft, said V-belt being mounted between said first and second pulleys; and

(d) covering means providing a confined space outside of said engine unit for housing said power transmission means within said confined space separate from said electric current generator.

4,631,470

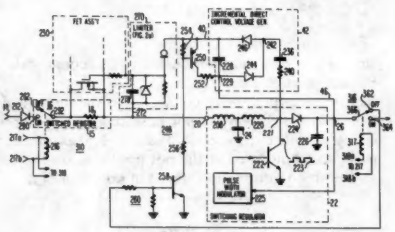
CURRENT SURGE LIMITED POWER SUPPLY

John D. Bingley, Bucks County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 13, 1985, Ser. No. 808,633

Int. Cl.⁴ G05F *1/56*

U.S. Cl. 323—282 **20 Claims**



1. An inrush surge current limited power supply, comprising:

regulating means including an input terminal adapted for receiving voltage to be regulated and also including an output terminal at which a regulated voltage is generated, said regulating means further including capacitance means coupled to said input terminal, whereby if a source of uncontrolled direct voltage is applied to said input terminal an undesirably large surge current occurs as a result of charging said capacitance means;

first switch means serially coupled with surge limiting resistance means to form a switched resistor, said switched resistor being coupled to said input terminal of said regulating means and also being adapted to be coupled to said source of uncontrolled direct voltage for applying conditioned direct voltage to said input terminal of said regulating means whereby said input surge current is limited to an acceptable magnitude, but said resistance means undesirably dissipates power during normal operation of said regulating means;

at least one field effect transistor including a gate electrode and a channel connected between source and drain electrodes, said channel being coupled across said resistance means and having conductivity which is low when the voltage between said gate and source electrodes is small and high when said voltage between said gate and source electrodes is large for preventing large surge currents immediately after said first switch means is rendered conductive at each turn-on;

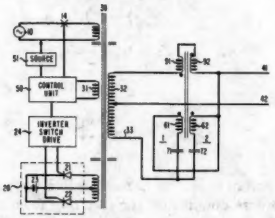
a source of direct control voltage coupled to one of said input and output terminals of said regulating means and to said gate of said field effect transistor for generating an

incremental direct control voltage from a source of alternating voltage and for adding said incremental direct control voltage to one of said conditioned and regulated voltages to generate and apply to said gate a sum direct control voltage, whereby said sum direct control voltage is greater than said one of said conditioned and unregulated voltages, whereby said field effect transistor is rendered conductive at a time after said one of said conditioned and regulated voltages have risen to near their steady-state values to bypass current around said resistance means thereby reducing said undesirable power dissipation.

4,631,471
INDUCTOR APPARATUS FOR APPLICATION OF FERRORESONANT REGULATORS

Fakhry A. Fouad, Morristown; Robert J. Kakalec, Madison, and Henry E. Menkes, Pine Brook, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 25, 1985, Ser. No. 715,366
Int. Cl.⁴ G05F 1/70
U.S. Cl. 323—306 **8 Claims**



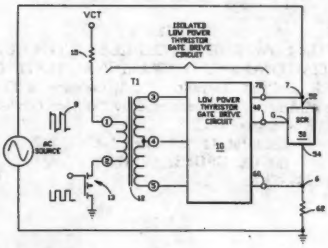
1. In combination:
a multiphase ferroresonant regulator,
an inductor structure combined with the multiphase ferroresonant regulator and accommodating at least two substantially independent self-inductive reactances which are utilized as independent regulation inductors for at least a first and second phase of the multiphase ferroresonant regulator, the inductor structure comprising;
a two window magnetic core including first and second outer legs and a center leg between the first and second outer legs,
a first inductor winding wound on the first outer leg,
a second inductor winding wound on the second outer leg, and
the center leg having a cross sectional area equaling a combined cross sectional area of the first and second outer legs,
whereby the coupling between the first and second inductor windings is less than one-half.

4,631,472
ISOLATED LOW POWER THYRISTOR GATE DRIVE CIRCUIT

Patrick E. McCollum, Yorba Linda; James K. Brownrigg, Brea, and Carl O. Linder, La Habra Heights, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 3, 1985, Ser. No. 740,465
Int. Cl.⁴ H02J 3/12
U.S. Cl. 323—325 **10 Claims**

1. An isolated low power thyristor gate drive circuit, for driving the gate of a thyristor having an anode and a cathode, the drive circuit being responsive to a signal voltage from a signal source, powered by a low voltage source with respect to a first reference potential, the gate drive circuit comprises:
a dual polarity source (DPS) responsive to said signal source for simultaneously providing a positive drive signal having a positive polarity with respect to a second reference potential and a negative drive signal having a negative polarity with respect to said second reference potential;
a normally open semiconductor device network having:
a current sink terminal,
a current source terminal, and
a gate terminal;
a normally conducting semiconductor device having:
a current sink terminal,
a current source terminal, and
a control terminal;
said normally open semiconductor device network current sink terminal being coupled to said thyristor anode, said normally open semiconductor device network gate being coupled to receive said dual polarity source positive drive signal;
said normally conducting semiconductor device current sink terminal being coupled to said second reference potential, said thyristor gate and to said normally open semiconductor device network current source terminal,



said normally conducting semiconductor device current source control terminal being responsive to said negative drive signal; and
said normally conducting semiconductor device current source terminal being coupled to said thyristor cathode;
said normally conducting semiconductor device providing a relatively low resistance path between said thyristor gate and cathode in the absence of said dual polarity source negative drive signal, and
a substantially open circuit in response to said negative drive signal;
said normally open semiconductor device operating to provide a conduction path between said thyristor anode and said thyristor gate in response to said dual polarity source positive drive signal and an open circuit between said thyristor anode and gate in the absence of said dual polarity source positive drive signal.

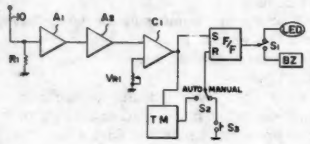
4,631,473
TRANSIENT ELECTROMAGNETIC FIELD DETECTOR

Masamitsu Honda, Tokyo, Japan, assignor to Nippon Univac Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 413,717, Sep. 1, 1982, abandoned. This application Nov. 27, 1984, Ser. No. 675,252
Claims priority, application Japan, Sep. 7, 1981, 56-140784
Int. Cl.⁴ G01R 31/02
U.S. Cl. 324—72.5 **7 Claims**

1. A transient electromagnetic field detector for detecting a low strength transient electromagnetic field having a duration of less than a microsecond, comprising:
a broadband rod antenna less than 30 mm long for producing a voltage due to the reception of the induction term of the transient electromagnetic field;
an amplifier having an input connected directly to the bottom end of said antenna, for directly receiving and amplifying said voltage induced on the antenna by the induction term of the transient;

a comparator circuit for comparing the output of the amplifier with a predetermined reference level to produce a signal when the amplifier output exceeds the reference level;



a memory circuit responsive to the signal from the comparator circuit for remembering that said signal has been produced; and

an indicator responsive to the memory circuit for indicating that the amplifier output has exceeded the reference level.

4,631,474

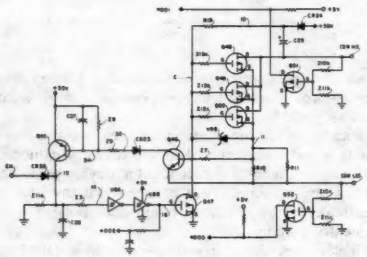
HIGH OR LOW-SIDE STATE RELAY WITH CURRENT LIMITING AND OPERATIONAL TESTING

Carlisle R. Dolland, Torrance, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 11, 1984, Ser. No. 629,862

Int. Cl.[4] G01R *31/02*; H03K *17/687*

U.S. Cl. 324—73 R **9 Claims**



1. A solid state relay having a high-side terminal and a low-side terminal for use in series with a load between a positive pole and a negative pole of a direct-current power supply, the negative pole being ground, the solid state relay being adapted for use either as a high-side switch in a configuration in which the high-side terminal is connected directly to said positive pole and the load is connected between the low-side terminal and ground, or as a low-side switch in a configuration in which the the load is connected between said positive pole and the high-side terminal with the low-side terminal connected directly to ground;

wherein said solid state relay comprises:

solid state switch means connected in series with current detection means between said high-side and low-side terminals, the solid state switch means having a control terminal for turning it on or off, on being a low-impedance state and off being a high-impedance state;

input means including Schmitt Trigger means coupled between an input terminal and said control terminal, responsive to first and second digital logic signals at the input terminal respectively to control a potential level at the control terminal for turning the solid state switch means on or off, bias means connected to the control terminal;

overload protection means coupled between said current detection means and said Schmitt Trigger means, including amplifying means and integrating means, for turning off the solid state device means in response to exceeding predetermined conditions of current and time; and

first test means having an input coupled to the high-side terminal and an output to a first indication terminal, and second test means having an input coupled to the low-side terminal and an output to a second indication terminal, for detecting given switch conditions and providing digital output indications.

4,631,475

METHOD OF DETECTING HAZARDOUS LINE VOLTAGES OVER A TWO-WIRE LINE

Lars E. Hammarberg, Handen, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

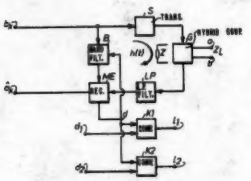
PCT No. PCT/SE83/00464, § 371 Date Jun. 29, 1984, § 102(e) Date Jun. 29, 1984, PCT Pub. No. WO84/02625, PCT Pub. Date Jul. 5, 1984

PCT Filed Dec. 20, 1983, Ser. No. 626,865

Claims priority, application Sweden, Dec. 21, 1982, 8207303

Int. Cl.[4] H04B *3/46*

U.S. Cl. 324—102 **3 Claims**



1. A method of detecting hazardous line voltages occurring over a two-wire connection (L) resulting from a cut-off or a short-circuiting, the connection being terminated by a hybrid coupler (G) and an apparatus (ME, B, LP) for adaptive echo elimination, which sends a digital signal (d) which stands in an unambiguous relation to the line impedance (Z_L) of the connection, said method comprising comparing said digital signal (d) with at least one digital limit value (d_1 or d_2), corresponding to an upper or lower limit of the normal value of the line impedance (Z_L), and sending an alarm signal in response to the thusly made comparison.

4,631,476

MEMORY PROGRAMMER INTERFACE FOR ELECTRONIC DEMAND REGISTER

Warren R. Germer, Dover, and Richard A. Balch, Rochester, both of N.H., assignors to General Electric Company, Somersworth, N.H.

Filed Oct. 11, 1984, Ser. No. 659,688

Int. Cl.[4] G01R *11/64*

U.S. Cl. 324—103 R **7 Claims**

1. An interface for interfacing a modular electronic demand register and a non-volatile memory programmer, said electronic demand register being of a type which includes a non-volatile memory comprising:

a circuit board in said electronic demand register;

means for mounting said non-volatile memory on said circuit board;

a housing for substantially completely enclosing said circuit board and said non-volatile memory;

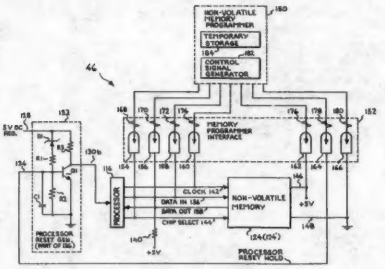
a plurality of conductive pads on said circuit board;

at least one slot in said housing aligned over at least some of said plurality of conductive pads;

a plurality of spring-pin connectors on said non-volatile memory programmer;

means for aligning said electronic demand register on said non-volatile memory programmer with said plurality of spring-pin connectors aligned with corresponding ones of said at least some of said plurality of conductive pads;

means for urging ends of said plurality of spring-pin connectors through said at least one slot and into resiliently urged contact with said at least some of said plurality of conductive pads; and



means for holding said electronic demand register in position on said non-volatile memory programmer with said plurality of spring-pin connectors resiliently urged into contact with said at least some of said plurality of conductive pads.

4,631,477

METHOD FOR ELIMINATING SPURIOUS SIGNALS IN A MEASURING INSTALLATION FOR IDENTIFYING THE POSITION OF A RIGID BODY IN SPACE

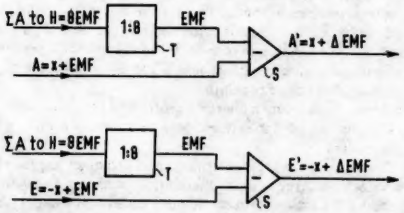
Bernd Nickel, Lorsch, and Wolfgang Schorr, Heppenheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,298

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1983, 3327742

Int. Cl.⁴ G01B *7/14*; A61B *5/10*

U.S. Cl. 324—207 **3 Claims**



1. A method for measuring the location of a fixed body in space by evaluating a plurality of signals respectively obtained from a plurality of magnetic flux receivers spaced from a magnetic flux generator carried on said fixed body, said receivers each having means defining the corner points of a pair of spaced parallel squared with said flux generator therebetween, each receiver generating a signal corresponding to the magnetic flux or change in magnetic flux generated by said flux generator and said signals being evaluated by the method comprising the steps of:

adding all signals from all of said receivers and thereby forming an aggregate interference signal;

subtracting said aggregate interference signal from each of the signals obtained from each receiver for eliminating the influence of external field interference from the resulting measurement.

4,631,478

METHOD AND APPARATUS FOR USING SPRING-TYPE RESISTIVE ELEMENTS IN A MEASUREMENT BRIDGE CIRCUIT

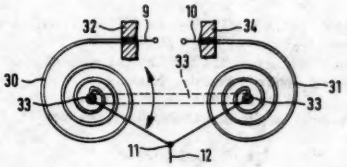
Manfred Knetsch, and Wolfgang Kühne, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,173

Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3218913

Int. Cl.⁴ G01B *7/14*; H01F *21/02*

U.S. Cl. 324—207 **6 Claims**



1. An apparatus for converting a movement into a variable electrical voltage, which depends on the movement in accordance with an arbitrarily predeterminable function, and having at least one variable inductive measuring resistor located in an electrical current circuit, said resistor comprising a measuring spiral spring including an electrically conductive helix said measuring spiral spring being connected to a holder means and arranged to extend in a single plane and to exhibit rotational movement about the center of said measuring coil within said plane, said holder means being rotatable selectively to increase and decrease tension in said measuring spiral spring, and said spiral spring further is connected to a means for measuring rotational movement of said holder means as a function of said variable electrical voltage.

4,631,479

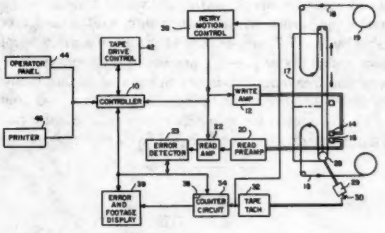
ERROR LOCATOR FOR HIGH-SPEED INSPECTION OF MAGNETIC TAPE

Hirokazu Haga, Euless, Tex., assignor to Graham Magnetics Inc., North Richland Hills, Tex.

Filed Apr. 18, 1983, Ser. No. 486,191

Int. Cl.⁴ G01R *33/12*; G01N *27/72*; G11B *27/36*; B08B *7/00*

U.S. Cl. 324—212 **7 Claims**



4. In apparatus for inspecting and refurbishing the coating of a continuous, coated web, said apparatus comprising:

(a) means to detect a fault in said coating;

(b) means to stop said web after it has passed fault-detecting means;

(c) means to refurbish said coating at the point of said fault; and

(d) means to return any fault detected on said web to a return

position where it may be passed again through said refurbishing means;

(e) the improvement wherein said apparatus comprises electronic means to track the exact position of said fault and to compensate for inertial of the web on stopping and starting providing a tracking of the position of said fault through a repetitive number of attempts to refurbish said coating, said electronic means comprising a web-drive tachometer, and digital counting means to count and store digital pulses derived from the output of said tachometer as a function of the position of said tape.

4,631,480

NUCLEAR MAGNETIC RESONANCE METHOD AND APPARATUS

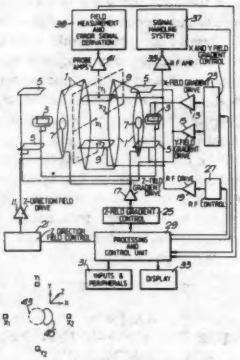
Ian R. Young, Sunbury-on-Thames, England, assignor to Picker International Limited, Wembley, England

Filed Oct. 4, 1983, Ser. No. 539,008

Claims priority, application United Kingdom, Oct. 13, 1982, 8229193

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—309 **6 Claims**



5. An imaging apparatus comprising means for applying RF magnetic field pulses of a predetermined frequency effective to excite nuclear magnetic resonance in a region including part of a body and means for measuring the free induction decay signal from said region, characterised in that said apparatus includes a quantity of a material of known nuclear magnetic resonance properties within said region, said quantity being excitable by said RF magnetic field pulses of a predetermined frequency, said material being present in sufficient quantity to enhance said free induction decay signal, and further including means for processing said free induction decay signal contributed by said material for enhancing the signal to noise ratio of the total free induction decay signal from said region.

4,631,481

N.M.R. SHIMS

Ian R. Young, Sunbury-on-Thames; Philip R. Evans, Bath, and Peter A. Luker, Wembley, all of England, assignors to Picker International Limited, Middlesex, England

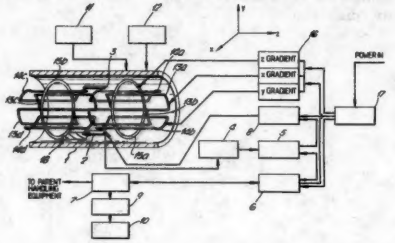
Filed Jan. 24, 1985, Ser. No. 694,424

Claims priority, application United Kingdom, Jan. 30, 1984, 8402360

Int. Cl.⁴ G01R *33/22*

U.S. Cl. 324—320 **6 Claims**

1. A method of reducing magnetic field inhomogeneities in N.M.R. apparatus, said method comprising the steps of cutting to size a deformable substantially non-electrically conducting body incorporating dispersed magnetic material but containing



substantially no hydrogen nuclei and applying said body to a supporting surface of the N.M.R. apparatus.

4,631,482

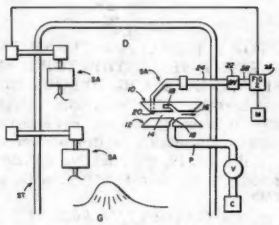
DUST FLOW INDUCING MONITOR

Robert E. Newton, Tewksbury, and Russell S. Girgenti, South Hamilton, both of Mass., assignors to Auburn International, Inc., Danvers, Mass.

Filed Oct. 9, 1984, Ser. No. 658,586

Int. Cl.⁴ G01N *27/60*

U.S. Cl. 324—454 **3 Claims**



1. Apparatus for dust concentration detection in a gas volume comprising suspended dust particles comprising:

(a) at least one means for converting a selected portion of the gas volume into a small cross-section i.e., less than one squ. in., fast gas stream of velocity of at least 1,000 feet per minute, said means comprising a gas flow inductor as a source of negative pressure,

(b) means for creating a charge transfer and resultant electrical signal varying in relation to dust concentration in the gas stream,

(c) the apparatus being constructed and arranged to provide a velocity-charge transfer match that produces a sensitive reading and avoids dust particle collection within the means for creating, and

(d) apparatus wherein the means for converting comprises a gas flow inductor as a source of negative pressure, wherein the inductor comprises a Venturi with a throat and with annular inductor gas flow through a portion thereof downstream of the throat of said Venturi.

4,631,483

PARTICLE ANALYZING APPARATUS AND METHOD OF MOVING PARTICLES IN SUSPENSION THROUGH SUCH APPARATUS

Oscar Proni, Hollywood, and Bobby D. James, Hialeah, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Feb. 1, 1984, Ser. No. 576,096

Int. Cl.⁴ G01N *27/00*

U.S. Cl. 324—71.4 **10 Claims**

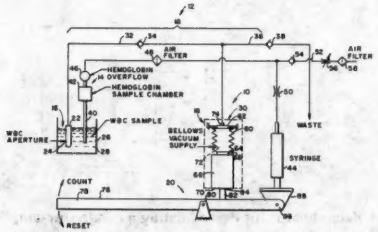
1. A particle analyzing apparatus comprising:

a particle counting device wherein a suspension of particles

is caused to be moved during a counting interval through an aperture, said aperture having an effective electrical impedance which is changed with the passage of each particle therethrough; and

fluid connection means connected to said particle counting device for drawing a quantity of said suspension through said aperture for a time period, said fluid connection means including a source of vacuum for generating a substantially constant level of vacuum during said counting interval, said source of vacuum comprising:

bellows means having an axis of symmetry and an end, and



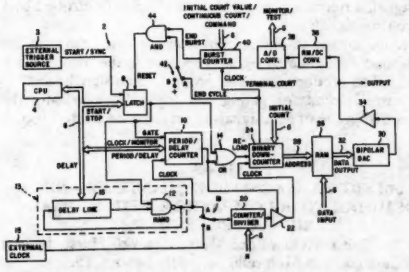
constant force means connected to said end of said bellows means, said constant force means having a vertical axis of symmetry, whereby the same quantity of said suspension is drawn through said aperture during each counting interval.

4,631,484

MULTIMODE PULSE GENERATOR

Jacob H. Malka, Fair Lawn, and Mordechai Friedlander, Palisades Park, both of N.J., assignors to Allied Corporation, Morris Twp., Morris County, N.J.

Filed Dec. 21, 1984, Ser. No. 684,757
Int. Cl.[4] H03K *3/86, 5/26*
U.S. Cl. 328—63 **16 Claims**



1. A pulse generator for providing output pulse waveform cycles having an expanded resolution period and phase synchronization to external trigger pulses from an external trigger source, characterized by:

memory means for storing predetermined pulse output waveforms;

latch means receiving the external trigger pulses and latched thereby for providing outputs;

means for providing delay data;

clock means including an internal clock having delay line means connected to the delay data means and responsive to the data therefrom for providing delay outputs, and first gating means connected to the delay line means and to the latch means for gating the latch outputs and the delay outputs and for providing clock outputs in phase synchronization with the latch outputs; and

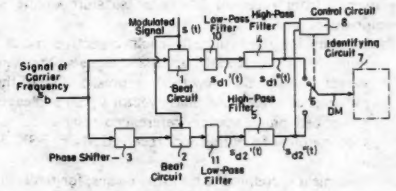
first counter means connected to the latch means, the clock means and the memory means, and responsive to the outputs from the latch means and the clock means for addressing the memory means, whereby the memory means provides predetermined stored output pulse waveform cycles, each cycle having a maximum of three periods, one of which is the expanded resolution period.

4,631,485

SYNCHRONOUS DEMODULATOR FOR AMPLITUDE MODULATED SIGNALS

Guido Torelli, S. Alessio, and Vincenzo Daniele, Milan, both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Catania, Italy

Filed Dec. 28, 1984, Ser. No. 687,739
Claims priority, application Italy, Dec. 30, 1983, 24478 A/83
Int. Cl.[4] H03D *1/06*
U.S. Cl. 329—50 **5 Claims**



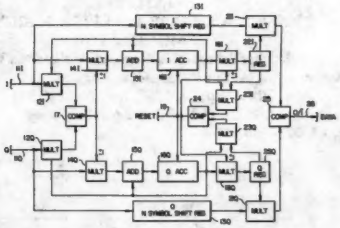
1. A synchronous demodulator for amplitude modulated carrier signals, comprising a first beat circuit having a first input fed with the modulated signal and a second input fed with a beat signal substantially at the same frequency as the carrier of said modulated signal; a second beat circuit having a first input fed with said modulated signal and a second input fed with said beat signal phase-shifted by 90°; a commutator for alternately connecting the output signals of said first and second beat circuits to a common output of the demodulator; and control circuit means with an operation threshold for controlling switching of said commutator according to the amplitudes of the outputs signals of said beat circuits.

4,631,486

M-PHASE PSK VECTOR PROCESSOR DEMODULATOR

James L. Snell, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 1, 1985, Ser. No. 718,285
Int. Cl.[4] H03D *3/06, 3/18*
U.S. Cl. 329—50 **45 Claims**



1. For use in a demodulator for detecting information signals which have been encoded in the form of M-ary phase shift keying signals, a method of generating a reference phase signal through the use of which information signals are recovered from received M-ary phase shift keying signals comprising the steps of:

(a) for a respective one of a plurality of received M-ary PSK signals, generating M respective vector sum signals respectively representative of the vector sums of a reference phase vector signal and each of M prescribed phase vectors referenced relative to said respective one of a plurality of received M-ary PSK signals;

(b) replacing said reference phase vector signal with that one

of the vector sum signals generated in step (a) whose magnitude is largest; and

(c) repeating steps (a) and (b) for a prescribed number N of received M-ary PSK signals to derive a reference phase vector signal that has been refined over said prescribed number N of received signals; whereby

upon completion of steps (a)–(c), the refined reference phase vector signal corresponds to said reference phase signal through the use of which information signals encoded in the form of M-ary PSK signals are recovered.

30. For use in a demodulator for detecting information signals which have been encoded in the form of M-ary phase shift keying signals, an arrangement for generating a reference phase signal through the use of which information signals are recovered from received M-ary phase shift keying signals comprising:

first means for generating, for each respective one of a plurality N of received M-ary PSK signals, M respective vector sum signals respectively representative of the vector sums of a reference phase vector signal and each of M prescribed phase vectors referenced relative to said respective one of a plurality of received M-ary PSK signals; and

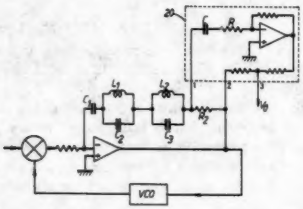
second means, coupled to said first means, for replacing said reference phase vector signal with that one of the vector sum signals generated by said first means whose magnitude is largest; whereby

upon said second means having replaced said reference phase vector signal for the Nth one of said plurality N of received M-ary PSK signals there is obtained a refined reference phase vector signal corresponding to said reference phase signal through the use of which information signals encoded in the form of M-ary PSK signals are recovered.

4,631,487
PHASE LOCK LOOP TELEVISION SIGNAL DEMODULATOR

Brian H. Beech, Bishopstoke, England, assignor to Independent Broadcasting Authority, London, England

Filed Sep. 24, 1985, Ser. No. 779,571
Int. Cl.[4] H03D 3/24; H04N 9/66
U.S. Cl. 329—50 5 Claims

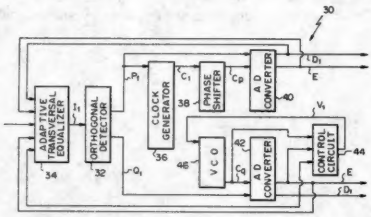


1. A phase lock loop demodulator including a loop amplifier and filter and an equaliser circuit, wherein the amplifier and filter has its transfer function optimised for the presence of sound and colour subcarriers, and wherein the equaliser circuit has a transfer function which is independent of the transfer function of the loop amplifier and filter.

4,631,488
QAM DEMODULATOR WITH DISTORTION COMPENSATION

Yasuharu Yoshida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 4, 1985, Ser. No. 804,426
Claims priority, application Japan, Dec. 10, 1984, 59-260374
Int. Cl.[4] H03D 3/18
U.S. Cl. 329—50 8 Claims



1. A demodulator for demodulating a quadrature-amplitude modulated signal, comprising:

an orthogonal detector for detecting the quadrature-amplitude modulated signal to produce first and second demodulated signals;

a first clock generator for regenerating a signal which is synchronous to a clock out of transition points of the quadrature-amplitude modulated signal or the first demodulated signal;

a first phase shifter for shifting a phase of said regenerated signal of said first clock generator to produce a first clock signal;

a first analog-to-digital converter for discriminating the first demodulated signal responsive to the first clock signal to produce a first group of data signals;

a second clock generator for producing a second clock signal, a frequency or a phase of which is controlled by a control signal;

a second analog-to-ditigal converter for discriminating the second demodulated signal responive to the second clock signal to produce a second group of data signals; and

a control circuit for gating and logically processing the second group of data signals to produce the control signal.

4,631,489
FM SIGNAL MAGNITUDE QUANTIZER AND DEMODULATOR COMPATIBLE WITH DIGITAL SIGNAL PROCESSING

Kevin M. Laird, Haltom, and Walt Rozanski, Hurst, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1985, Ser. No. 751,916
Int. Cl.[4] H03D 3/00, 3/24
U.S. Cl. 329—110 3 Claims

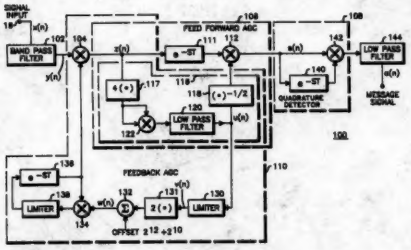
1. An improved FM demodulator circuit for recovering and demodulating a FM signal in a received carrier signal, which demodulator circuit is compatible with digital signal processing and effective in maintaining a relatively constant envelope at the input to the associated FM detector, said demodulator circuit comprising:

(a) means including bandpass filter means for selecting a desired band of IF frequencies;

(b) feedback AGC means, including multiplier means coupled to the output of said bandpass filter means, and an AGC input and output, said feedback AGC means removing slow envelope variations of the FM IF signal; and

(c) feedforward AGC means, coupled to said output of said feedback AGC means, for eliminating fast amplitude modulation variations present on the FM IF signal, said feedforward AGC means further having a first output comprising the recovered FM signal and a second output

coupled to said AGC input of said feedback AGC means, said second output comprising the square of the envelope of the recovered FM signal; and



(d) FM detector means coupled to said first output of said feedforward AGC means for recovering a baseband signal.

4,631,490

AUDIO OUTPUT AMPLIFYING DEVICE

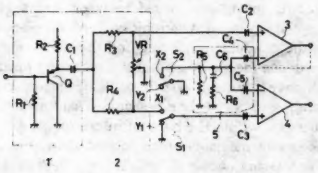
Yoshiaki Takahashi, Saitama, Japan, assignor to Pioneer Electronic Corp., Tokyo, Japan

Filed Dec. 19, 1984, Ser. No. 683,447

Claims priority, application Japan, Dec. 19, 1983, 58-195771[U]

Int. Cl.⁴ H03F *3/68*

U.S. Cl. 330—51 **6 Claims**



1. An audio output amplifying device, comprising:

first differential amplifier means to which an audio output is supplied at a positive phase input;

signal selecting means for selectively outputting one of said audio output and a predetermined fixed voltage;

second differential amplifier means to which an output of said signal selecting means is applied at a positive phase input;

feedback means having an input terminal selectively connected to or disconnected from an output of said first differential amplifier, and output terminals respectively connected to negative phase input terminals of said first and second differential amplifier means so that said output of said first differential amplifier means is selectively fed back to said negative phase input terminals of said first and second differential amplifier means via said feedback means; and

switching means connected between said input terminal of said feedback means and a predetermined reference potential point, said switching means being turned on and said feedback means being disconnected from said first differential amplifier output, to disable said feedback means when an instruction is present to cause said signal selecting means to selectively output said audio output.

4,631,491

BIPOLAR TRANSISTOR RF POWER AMPLIFIER

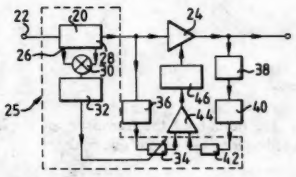
Colin R. Smithers, Sutton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 16, 1985, Ser. No. 755,635

Claims priority, application United Kingdom, Aug. 17, 1984, 8420934

Int. Cl.⁴ H03F *1/30, 3/24*

U.S. Cl. 330—149 **3 Claims**



1. A bipolar transistor R.F. power amplifier comprising a bipolar transistor having base and collector electrodes, an input circuit coupled to the base electrode and an output circuit coupled to the collector electrode, an adjustable collector voltage power supply coupled to said collector electrode, means for deriving a characteristic of an input signal in the input circuit, means for deriving the same type of characteristic of an output signal in the output circuit, and comparator means for comparing said corresponding characteristics of the input and output signals and providing a feedback control signal to the collector voltage power supply, wherein the collector voltage power supply is adapted to adjust said collector supply voltage so that the bipolar transistor operates in a mode where gain, phase shift and input impedance are simultaneously linearised, found at the onset of gain saturation in response to variations in input drive level;

further comprising means for sensing the magnitude and sign of the amplifier input reflections and means for deriving another control signal in response to the reflections sensed, said another control signal being used to adapt the feedback conditions of the amplifier; and

wherein said sensing means comprises a directional coupler connected to the input circuit of the bipolar transistor, the directional coupler having forward and reflected ports which are coupled to respective inputs of a synchronous detector, the output signal from which is used to provide said another control signal.

4,631,492

ULTRA HIGH FREQUENCY POWER AMPLIFIER

John Magarshack, Rueil Malmaison, and Dimitri Pavlidis, Paris, both of France, assignors to Thomson-CSF, Paris, France

Filed Apr. 26, 1984, Ser. No. 604,036

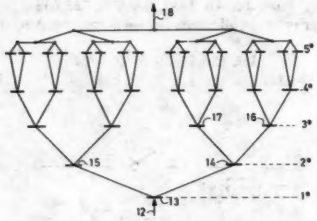
Claims priority, application France, Apr. 29, 1983, 8307179

Int. Cl.⁴ H03F *3/68*

U.S. Cl. 330—277 **10 Claims**

1. An ultra high frequency power amplifier comprising an input terminal to which a low level input signal is applied and an output terminal from which is collected a high power signal, the structure of said amplifier, of arborescent form, comprises a pluraltiy of series connected amplifier stages, the first stage comprising a single transistor and the remaining stages comprising a plurality of elementary transistors, each transistor having one input terminal and at least two output terminals, the

transistor of the first stage being directly connected to and directly driving at least two transistors of the following amplification stage, the outputs of the transistors of the last stage being connected to a single output terminal.

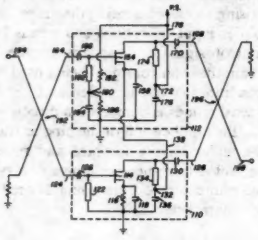


4,631,493

CIRCUIT FOR DC BIASING

George D. Vendelin, Saratoga, and Behruz Rezvani, Cupertino, both of Calif., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 18, 1985, Ser. No. 712,879
Int. Cl.[4] H03F *3/193, 3/60, 3/68*
U.S. Cl. 330—277 7 Claims



1. The combination comprising:

a first stage for connection to at least one of a pair of power-supply potentials; and

a second stage for connection to at least the other one of said pair of power-supply potentials, said second stage including,

a field-effect transistor having a drain, a source, and a gate,

means for coupling said drain of said second-stage transistor to said other one of said pair of power-supply potentials,

means for DC coupling said source of said second-stage transistor to said first stage and for AC decoupling said source of said second-stage transistor from said first stage, and

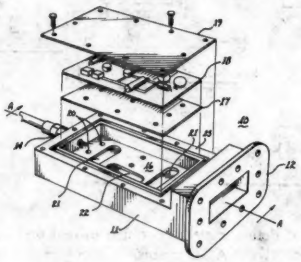
means for biasing said gate of said second-stage transistor at a predetermined DC potential which is independent of the level of the DC current which flows through said second-stage transistor establishing the DC potential developed at said source of said second-stage transistor.

4,631,494

CONDUCTIVE HOUSING AND BIASING SYSTEM FOR MICROWAVE INTEGRATED CIRCUITS

Harry J. Gould, 1649 E. Hale, Mesa, Ariz. 85204

Filed Jul. 20, 1984, Ser. No. 633,104
Int. Cl.[4] H03F *3/60*
U.S. Cl. 330—286 14 Claims



1. A system for processing microwave signals residing within a frequency band of interest, said system comprising:

(a) a segment of transmission line including a conductive ground plane, a first strip conductor and a dielectric substrate therebetween;

(b) a processing circuit including at least one transist or located on said segment, said transistor having source, drain and gate electrodes;

(c) input and output means electrically coupled to spaced regions of the strip conductor and adapted for connection to external circuit means;

(d) a conductive housing including receiving means for placement of said segment of transmission line therein;

(e) means for applying a supply voltage between said conductive housing and said strip conductor;

(f) dielectric means interposed between said segment and said receiving means whereby said ground plane is spaced from the conductive housing and the strip conductor;

(g) impedance means formed in the receiving means of said conductive housing, said impedance means electrically coupling said conductive housing to said ground plane at frequencies within the band of interest; and

(h) bias circuit means coupled to said strip conductor and said processing circuit for establishing the operating voltages therefor.

4,631,495

LOW-NOISE RF PREAMPLIFIER (ESPECIALLY FOR NUCLEAR MAGNETIC RESONANCE SYSTEM)

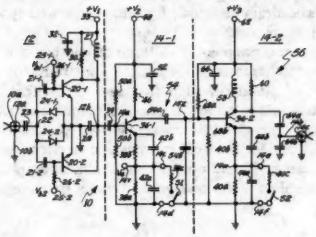
Otward M. Mueller, Ballston Lake, and William A. Edelstein, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 6, 1985, Ser. No. 730,522
Int. Cl.[4] H03F *3/04*
U.S. Cl. 330—310 16 Claims

1. A radio-frequency (RF) preamplifier comprising:

a linear low-noise input stage having a plurality N of bipolar junction transistors having like electrodes effectively

connected in RF parallel, and with each of the base electrodes of said plurality of parallel bipolar junction transis-



tors being isolated from one another for direct current flow.

4,631,496

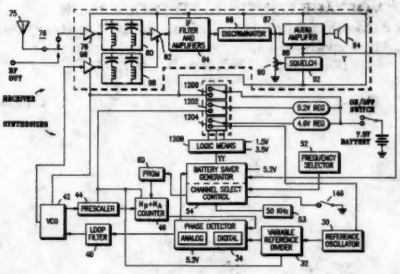
BATTERY SAVING SYSTEM FOR A FREQUENCY SYNTHESIZER

Jaime A. Borras, Hialeah, and Jose I. Suarez, Miami, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 650,977, Sep. 14, 1984, abandoned, which is a continuation of Ser. No. 251,558, Apr. 6, 1981, abandoned. This application Dec. 13, 1985, Ser. No. 808,905

Int. Cl.⁴ H03L *7/18*; H04B *1/40*

U.S. Cl. 331—1 A **15 Claims**



1. In a digital frequency synthesizer having a reference frequency source, sample and hold phase detector, voltage controlled oscillator and variable frequency divider, a power saving system comprising:

a power source; and

a power saving generator means generating a power saving signal having a predetermined duty cycle and period, said generator means, being coupled between said synthesizer and said power source, and responsive to the hold timing periods of said phase detector to interrupt power to said reference frequency source and variable divider in synchronism with the establishment of the hold timing periods of the phase detector to conserve power yet maintain the voltage controlled oscillator output without deviation or interruption.

4,631,497

INJECTION LOCKED RF OSCILLATOR WITH CONTROL HOOP

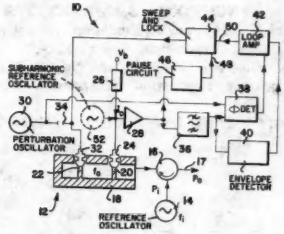
Robin M. Braun, Cape Town, South Africa, assignor to Plessey South Africa Limited, Cape Province, South Africa

Filed May 31, 1985, Ser. No. 739,695

Claims priority, application South Africa, Jun. 5, 1984, 84/4213

Int. Cl.⁴ H03L *7/12, 7/24*

U.S. Cl. 331—4 **9 Claims**



1. An injection locked RF oscillator, which comprises:

an RF source having a variable resonance frequency, for generating RF output power;

a reference oscillator for generating a reference signal having a reference frequency, and for injecting the reference signal into the RF source, thereby to cause injection locking of the RF source onto a lock frequency equal to the reference frequency or a harmonic of the reference frequency; and

a control loop comprising sensing means for sensing a parameter which varies in accordance with the difference between the lock frequency and the resonance frequency, and control means which is operative in response to the sensing means to control the resonance frequency;

said parameter being the current consumption of the RF source.

4,631,498

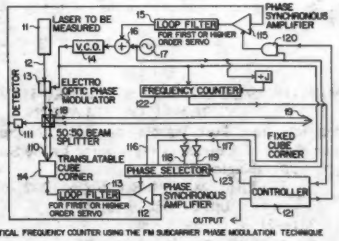
CW LASER WAVEMETER/FREQUENCY LOCKING TECHNIQUE

Gregory M. Cutler, Mountain View, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 26, 1985, Ser. No. 727,457

Int. Cl.⁴ H03L *7/00*

U.S. Cl. 331—9 **8 Claims**



1. A frequency locking circuit comprising:

a source of a beam of continuous wave, coherent radiation of frequency f_0;

means for phase modulating the beam, in response to a subcarrier of frequency f_1 that is itself modulated, to produce a phase modulated beam;

a filter through which the phase modulated beam passes, said

filter having a transfer function that has a characteristic frequency f_f;

a detector, responsive to the beam after the beam passes through the filter to produce a detector output signal;

means, responsive to the detector output signal, for adjusting the ratio of f_0/f_f to a fixed value L; and

means, responsive to the detector output signal, for adjusting the ratio of f_1/f_f to a fixed value K.

4,631,499

PHASE-LOCKED LOOP FOR A DIRECTLY MIXING SYNCHRONOUS AM-RECEIVER

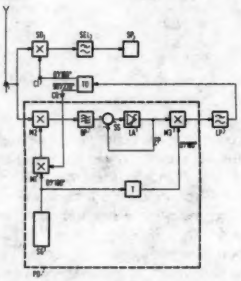
Wolfdietrich G. Kasperkovitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 25, 1985, Ser. No. 801,543

Claims priority, application Netherlands, Nov. 30, 1984, 8403648

Int. Cl.⁴ H03L 7/06; H03D 3/18; H03K 9/02

U.S. Cl. 331—11 **9 Claims**



1. A phase-locked loop comprising a controllable oscillator phase-coupled through a phase detection arrangement and a low-pass filter to receive an input carrier applied to a signal input of the phase detection arrangement, characterized in that the phase detection arrangement comprises first, second and third cascade-coupled mixer stages, an auxiliary mixing signal having a fundamental frequency being applied to said first and third mixer stages from a signal generator, an input of one of the first and second mixer stages being connected to the signal input of the phase detection arrangement and an input of the other of the two last-mentioned mixer stages being coupled to an output of the controllable oscillator, the output of said third mixer stage being coupled to said low-pass filter, said low-pass filter having a cut-off frequency which is lower than the fundamental frequency of said auxiliary mixing signal, said fundamental frequency being lower than the frequency of the input carrier.

4,631,500

MICROWAVE FREQUENCY DIVIDER HAVING REGENERATIVE OSCILLATION

Christen Rauscher, Fort Washington, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1984, Ser. No. 603,382

Int. Cl.⁴ H03B 19/00

U.S. Cl. 331—51 **2 Claims**

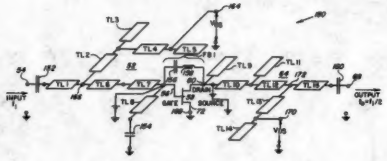
1. A regeneratively oscillating broadband microwave frequency divider circuit comprising:

nonlinear amplifier means for amplifying signals including a three-electrode field effect transistor connected between an input port and an output port, said field effect transistor exhibiting a nonlinear transconductance characteristic, said input port being adapted to receive a first signal having a frequency f_1;

said three electrode field effect transistor comprising a gate electrode, a drain electrode, and a source electrode, and being configured as a common source amplifier, said gate electrode forming said input port of said amplifier means and said drain electrode forming said output port of said amplifier means;

biasing means coupled to all three of said electrodes of said field-effect transistor for biasing said transistor at or just short of pinch off such that said field-effect transistor exhibits said nonlinear transconductance characteristic;

feedback means connected across two of said three electrodes of said field effect transistor between said output port and said input port of said nonlinear amplifier means for coupling a second signal having a frequency f_o that is



half said frequency f_1 from said output port to said input port of said nonlinear amplifier means, said first and second signals combining at said input port to modulate said nonlinear transconductance characteristic of said field effect transistor such that said first and second signals are mixed together and amplified in said field effect transistor to produce said second signal having a frequency f_o that is half said frequency f_1 said feedback means comprising an inductor and a d.c. blocking capacitor coupled in a non-resonant series circuit between said gate electrode and said drain electrode of said field-effect transistor;

whereby said frequency f_1 of said first signal is divided in half by said circuit to produce said frequency f_o of said second signal.

4,631,501

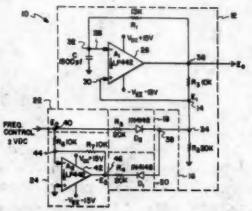
VOLTAGE CONTROLLED OSCILLATOR

Robert J. Matthys, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 1, 1985, Ser. No. 697,369

Int. Cl.⁴ H03K 3/35

U.S. Cl. 331—143 **13 Claims**



1. A voltage controlled circuit, comprising:

means for producing an output voltage that switches polarity, said switch in polarity being determined by a comparison of first and second voltages, said first voltage being established at a node;

means for varying said first voltage including:

first and second unidirectional current conducting means connected in parallel at said node and adapted to pass substantial current only in different directions through said node;

means for applying a first frequency control voltage to said

first unidirectional current conducting means, said first frequency control voltage having a first polarity; and

means for applying a second frequency control voltage to said second unidirectional current conducting means, said second frequency control voltage having a second polarity and being substantially equal in magnitude to said first frequency control voltage.

4,631,502

TRANSISTOR MODULATOR FOR CONVERTING VIDEO GAME SIGNALS INTO ANTENNA INPUT SIGNALS FOR A TELEVISION RECEIVER

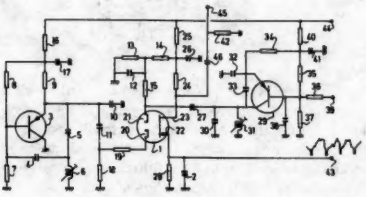
Nguyen Tran Kiem, Chatillon, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1985, Ser. No. 798,082

Claims priority, application France, Nov. 20, 1984, 84 17669

Int. Cl.⁴ H03C *1/36, 3/00*

U.S. Cl. 332—16 T **3 Claims**



1. In a circuit for processing video and sound signals of a video game so as to produce a composite output signal which may be applied to the antenna input of a domestic television receiver to produce a video and audio display of such video game, such processing circuit comprising a frequency modulated oscillator producing FM sound intercarrier signals from such sound signals and an oscillator producing VHF carrier signals, the improvement consisting of a transistor modulator comprising:

an MOS transistor having a source electrode, a drain electrode and two gate electrodes, one of said source and drain electrodes and said two gate electrodes constituting inputs to said transistor and the other of said source and drain electrodes constituting the output from said transistor; one of said input electrodes being connected to said FM oscillator to receive said FM sound intercarrier signals, a second one of said input electrodes being connected to said VHF oscillator to receive said carrier signals;

circuit means for applying said video signals to the third one of said input electrodes;

and impedance means connected to said other one of said source and drain electrodes, said MOS transistor being adapted to produce said composite signal across said impedance means.

4,631,503

GROOVED WAVEGUIDE SHORTING BLOCK AND METHOD OF ASSEMBLY

Paul R. Brown, Marlton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 27, 1985, Ser. No. 749,272

Int. Cl.⁴ H01P *1/28, 1/397*

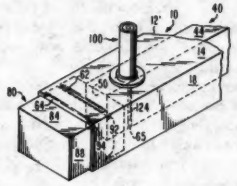
U.S. Cl. 333—24.1 **6 Claims**

1. The combination comprising

a deformable, conductive, waveguide having a pair of parallel, opposed relatively broad walls and a pair of parallel, relatively narrow walls extending between said broad walls;

a conductuve rigid block having a pair of substantially parallel, relatively broad faces, a pair of substantially parallel, relatively narrow faces extending between said broad faces and a groove in each of said broad faces extending across said broad faces and substantially perpendicular to said narrow faces;

said block extending into and substantially filling one end of said waveguide with said broad faces in substantial contact with said broad walls, said narrow faces disposed



adjacent said narrow walls and said grooves disposed within said waveguide; and

deformation in each of said broad walls extending into said groove adjacent thereto for securing said block to said waveguide and providing a radio frequency seal between said block and said broad walls.

4,631,504

IMPEDANCE CONVERSION TRANSFORMER

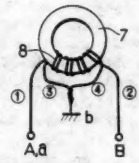
Takeshi Matsuda, and Harumi Kano, both of Tokyo, Japan, assignors to Showa Musen Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1984, Ser. No. 673,409

Claims priority, application Japan, May 28, 1984, 59-106405

Int. Cl.⁴ H01P *5/10*

U.S. Cl. 333—25 **1 Claim**



1. An impedance conversion transformer comprising:

a ferrite core having a permeability which reduces in proportion to an increase in frequency within a frequency band used; and

a pair of coils wound about said ferrite core in a bifilar arrangement so that the electric length of each of said coils is a half-wave length for each frequency within said band used, with one of said coils having the opposite terminals thereof being electrically connected to each other and grounded and with the impedance conversion and balanced to unbalanced conversion being achieved between the opposite terminals of the other coil.

4,631,505

RIGHT ANGLE MICROWAVE STRIPLINE CIRCUIT CONNECTOR

Frank J. Schiavone, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 3, 1985, Ser. No. 730,018

Int. Cl.⁴ H01P *5/08*

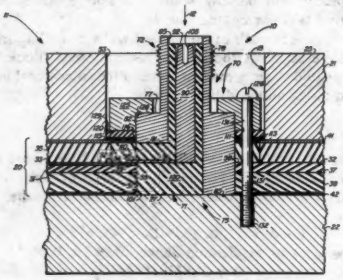
U.S. Cl. 333—33 **10 Claims**

1. A connector for use between a generally planar stripline circuit and a coaxial conductor extending perpendicularly thereto from one side thereof, the circuit having a ground plane spaced from said side and a conductive stripe disposed therebetween, the circuit defining a socket extending between said plane and said side, the socket having a greater transverse width between the stripe and said side than between the stripe

and said plane so that the stripe is accessible through said socket from said side; the coaxial conductor having a central conductive element, an outer conductive element circumscribing said central element, and a dielectric disposed therebetween; and the connector comprising:

a body having opposite ends and being configured to be received in such a socket with one of the ends juxtapositioned to such a ground plane, the other of said ends being adapted for connection to such a coaxial conductor and the body having;

a hollow conductor extending between said ends and bearing a planar surface at said other end disposed for engagement flatly with such a ground plane, the hollow conductor defining in one side thereof an opening disposed for alignment centrally with such a stripe when the body is so received;



an inner conductor disposed generally within and spaced from the hollow conductor, the inner conductor having a first portion which extends generally parallel to such a ground plane when the body is so received and which extends through said opening, said first portion extending outwardly of the hollow conductor and, outwardly thereof, being disposed to engage the stripe when the body is inserted into the socket in a direction from said one side toward said ground plane, and said inner conductor having a second portion extending from said first portion inwardly of said opening and generally perpendicular thereto to said one end of the body; and

means for releasably mounting the body on the circuit when the body is so received;

and means disposed at said one end of the body for electrically connecting the hollow conductor to said outer conductive element and for electrically connecting the inner conductor to said central conductive element.

4,631,506

FREQUENCY-ADJUSTABLE COAXIAL DIELECTRIC RESONATOR AND FILTER USING THE SAME

Mitsuo Makimoto, Yokohama; Haruyoshi Endo, and Sadahiko Yamashita, both of Sagamihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 15, 1983, Ser. No. 514,262

Claims priority, application Japan, Jul. 15, 1982, 57-124085

Int. Cl.⁴ H01P *7/04*

U.S. Cl. 333—224 **1 Claim**

1. A coaxial dielectric resonator comprising:

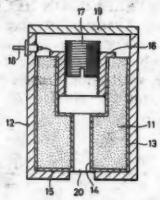
a longitudinally extending hollow dielectric member having two ends and longitudinally extending cylindrical inner and outer surfaces extending between the two ends;

an inner hollow conductor disposed on said cylindrical inner surface extending between the two ends forming a longitudinally extending passage therethrough;

an outer conductor disposed on said cylindrical outer surface extending between the two ends, said outer conductor also extending across one of the two ends to contact said inner conductor to form a short-circuit end;

a third, hollow cylindrical conductor having a threaded inner surface and an outer surface contacting said inner conductor adjacent the other of the two ends of said hollow dielectric member;

a fourth, cylindrical conductor having a threaded circumference engaging the threaded inner surface of said third conductor, the fourth conductor having means adapted to be engageable through said passage with an adjustment



tool by which the position of the fourth conductor is longitudinally adjustable, said engageable means being located inwardly from said short-circuit end;

a fifth conductor contacting said outer conductor and longitudinally spaced from said fourth conductor to form a capacitive coupling therewith; and

wherein said inner surface of the dielectric has a small diameter portion and a large diameter portion defining a stepped shoulder therebetween, said third conductor being accommodated in said large diameter portion.

4,631,507

VARIABLE COMPOSITION SWITCHING DEVICE

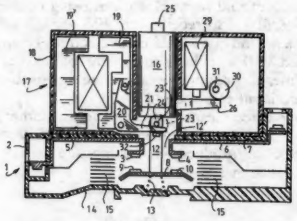
Jean-Pierre Guery, Bezons; Gerald Gashet, Puteaux; Jacques Olifant, Nanterre, and Raymond Plumeret, Asnieres, all of France, assignors to La Telemecanique Electrique, France

Filed Sep. 27, 1985, Ser. No. 780,772

Claims priority, application France, Sep. 27, 1984, 84 14826

Int. Cl.⁴ H01H *73/00, 77/02*

U.S. Cl. 335—27 **17 Claims**



1. A variable composition switching device comprising a set of modular components assembled together as required to ensure miscellaneous switching functions such as those usually associated with a switch, a contactor, a contactor with relay, the said assembly comprising:

(i) at least one basic modular component incorporating a controllable switching device, said controllable switching device including:

at least one fixed contact unit,

a mobile element carrying at least one mobile contact unit, and able to move between a first position in which the mobile contact unit is in contact with the fixed contact unit, and a second position in which the mobile contact unit is separated from the fixed contact unit,

elastic means exerting a pull on the mobile element that tends to force the latter to return to the said second position, and

an operating rod, rigidly attached to the mobile element or part of same, this operating rod comprising at least one bearing surface upon which a control force antagonistic to the elastic means can be applied to cause the mobile element to move into the first position,

and

(ii) at least two types of modular control components with means assembled to the basic modular component, said modular control components comprising :

a modular direct swiching control component involving direct-action operating means, able to exert on the bearing surface of at least one basic modular component a fast enough control action with sufficient force to ensure proper switching operation;

one modular indirect switching control component involving operating means which, in response to a slow order, or one with insufficient energy to ensure proper switching, act on the bearing surface of at least one basic modular component by means of a potential energy accumulation tripping device, wherein said potential energy accumulation tripping device can take a set stable state and a tripped stable state, a setting transient phase and a tripping transient phase, said potential energy accumulation tripping device including:

actuating means that can successively take a stable tripped position in which it exerts an action antagonistic to that of the elastic means on the bearing surface of the operating rod of the switching device, to make sure that the mobile element is securely held in the first position, and a stable reset position in which the actuating means allows the mobile element to return to its second position;

potential energy accumulation means designed to store potential energy during the setting phase, and to restitute it as mechanical energy on the actuating means, and so to cause the mobile element to move from the second position to the first position during the tripping phase;

setting means involving at least one setting part upon which energy can be applied during the setting phase and a setting mechanism designed to apply the said energy to cause the actuating means to move from the tripped position to the set position, and simultaneously to transmit part of the said energy to the potential energy accumulation means, and

a tripper involving at least one tripping part upon which at least one operating control action can be applied to generate the tripping phase, whereas this control action can be produced by one or several control and/or protection means designed to induce a sudden change of state in the controllable switching device.

4,631,508

ELECTRO-MECHANICAL DEVICES INCORPORATING FUSE CARTRIDGES

Jean P. Cinquin, Cremieu; Christian Gazzolo, Villeurbanne, and Michel Pisciotta, Bron, all of France, assignors to Ferraz, Lyons, France

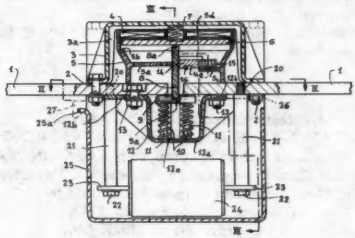
Filed Sep. 20, 1985, Ser. No. 778,470

Int. Cl.[4] H01H *51/00, 53/00*

U.S. Cl. 335—142 **8 Claims**

1. An electro-mechanical circuit breaker having improved structure, the breaker being of the type having opposed fixed contacts spaced apart across a gap and having an insulating plate guided in a housing for reciprocation within the gap, the plate being spring-urged from a open position to a closed position and the plate carrying mobile contacts which in the closed position connect said fixed contacts together and which in the open position are spaced therefrom, and the breaker having a conductive disc in the housing disposed normal to the plate and having a coil in the housing disposed adjacent to the conductive disc on the opposite side thereof from the insulating plate and operative when the coil is energized to repel the conductive disc against the plate and drive it from its closed position toward a fully open position, and the breaker having a fuse cartridge connected in shunt with the fixed contacts and operative to melt after a brief delay when the contacts are driven open, the improvements comprising:

(a) a latch bolt supported in the housing and spring-urged toward the insulating plate, and the plate having a latching



notch therein disposed to lie opposite the latch bolt when the plate is in fully open position; and

(b) the housing retaining the conductive disc between the coil and the insulating plate and normal to the plate and having a shoulder disposed to stop motion of the disc after it has driven the plate part-way toward its fully open position, the kinetc energy of the insulating plate carrying it the rest of the way to latch with the bolt in fully open position.

4,631,509

ELECTRICAL INDUCTION APPARATUS WITH SUPPORT INSIDE CASING

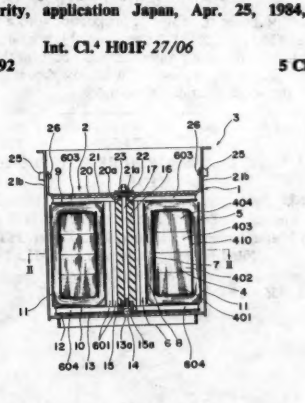
Kazuhiro Arii, Kobe; Yasuo Yamamoto, Settsu; Nobuyuki Sumida, Sakai; Katsumi Hanaoka, Kawanishi, and Kazuhiro Tanaka, Suita, all of Japan, assignors to Allied Corporation, New York, N.Y.

Filed Apr. 24, 1985, Ser. No. 726,450

Claims priority, application Japan, Apr. 25, 1984, 59-61100[U]

Int. Cl.[4] H01F *27/06*

U.S. Cl. 336—92 **5 Claims**



1. An electrical induction apparatus having a magnetic core unit being comprised of a toroidal magnetic core and at least one winding wound around the core and a casing for housing the magnetic core unit therein, comprising

a support plate for supporting the bottom of the magnetic core unit having at least one opening,

means for positioning the unit at a predetermined position in the casing being engageable to the opening of the support plate,

a cylindrical member made of an insulating material which is so formed as to fit into the central hole of the unit,

a mounting plate for fixing the unit being disposed on the top of the unit,

an axial member passing through the central hole of the cylindrical member, one end of which is connected to the supporting plate and the other end of which is projected outwardly in the axial direction thereof,

a nut means for fastening the mounting plate to hold the unit between the mounting plate and the supporting plate which is engageable to a threaded portion provided on the other end of the axial member,

wherein the mounting plate is fixed to the casing so as to hang the unit in the casing.

4,631,510

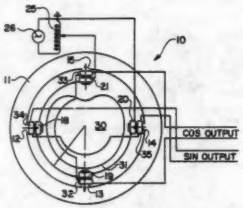
HARMONICALLY GRADED AIRGAP RELUCTANCE-TYPE ROTATING ELECTRIC RESOLVER

Ashok Nagarkatti; Robert E. Lordo, both of Charlotte, N.C., and Burkhart Kind, Pittsburgh, Pa., assignors to Powerton, division of Contraves Goerz Corporation, Charlotte, N.C.

Filed Sep. 3, 1985, Ser. No. 771,815

Int. Cl.[4] H01F *21/06*; H02K *19/24*

U.S. Cl. 336—135 **15 Claims**



1. A reluctance-type resolver for an electric machine comprising a toothed stator having input and output windings thereon and a rotor rotatably positioned within said stator, wherein said rotor defines a periphery profiled to produce during rotation a smoothly varying airgap according to a formula wherein the inverse of the radial airgap at any predetermined point on the rotor is proportional to a constant plus the sine of the product of the number of lobes on said rotor and the angle between the predetermined point on the rotor and a reference point on the stator, whereby the magnetic permeance of the airgap varies sinusoidally.

4,631,511

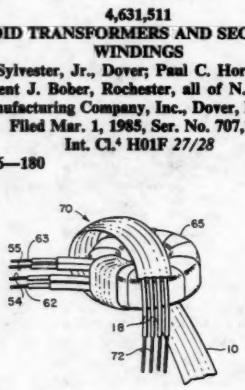
TOROID TRANSFORMERS AND SECONDARY WINDINGS

Robert D. Sylvester, Jr., Dover; Paul C. Horn, Somersworth, and Vincent J. Bober, Rochester, all of N.H., assignors to GFS Manufacturing Company, Inc., Dover, N.H.

Filed Mar. 1, 1985, Ser. No. 707,135

Int. Cl.[4] H01F *27/28*

U.S. Cl. 336—180 **8 Claims**



1. A toroid transformer having a primary winding with indexed turns distributed evenly around a toroidal core of permeable material and a plurality of separate multifilar secondary windings formed in separate layers over the indexed primary winding and around the toroidal core where the toroid transformer is characterized by a relatively high ratio of primary winding turns to secondary winding turns of approximately at least 6 and the secondary windings are formed over the compound curvature and irregular surface layers of the toroid transformer comprising:

a plurality of layers of electrically insulating tape formed over the primary winding around the toroidal core, each layer comprising successive overlapping turns of tape of elongate strip configuration, each turn lapping adjacent turns thereby increasing distance over material surfaces between layers;

a multifilar first secondary strap winding formed over the indexed turns of the primary winding and layers of electrically insulating tape in substantially equally spaced turns around the toroidal core, said first secondary strap winding comprising a flat array of a plurality of coplanar parallel secondary winding filaments electrically coupled in parallel, a first elongate strip of electrically insulating tape having an adhesive layer on one side adhesively bonded to one side of the multiple filaments, and a second elongate strip of electrically insulating tape having an adhesive layer on one side adhesively bonded to the other side ofthe filaments and to the first elongate strip, said first and second elongate strips being wider than the flat array of multiple filaments thereby forming a margin of two strips of adhesively bonded tape along the sides of the first secondary strap winding extending beyond the outside filaments of the first secondary strap winding thereby increasing distance over material surfaces between separate winding layers, the filaments of the first secondary strap winding being maintained in substantially equally spaced relationship relative to each other without crossover and relative to the turns of the primary winding over the compound curvature and uneven surfaces of the layers around the toroidal core by the first and second elongate strips adhesively bonded to each other and to the multiple filaments of the first secondary strap winding thereby optimizing mutual inductance between the first secondary strap winding and the primary winding and minimizing leakage inductance;

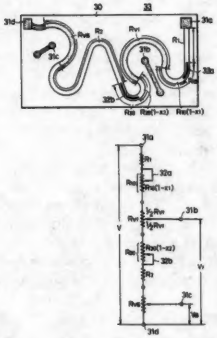
a second secondary strap winding formed directly over the first secondary strap winding in substantially equally spaced turns around the toroidal core without a separate electrically insulating layer of tape between the first and second secondary strap windings, said second secondary strap winding comprising a flay array of a plurality of coplanar parallel secondary winding filaments electrically coupled in parallel, a first elongate strip of electrically insulating tape having an adhesive layer on one side adhesively bonded to one side of the filaments, a second elongate strip of electrically insulating tape having an adhesive layer on one side adhesively bonded to the other side of the filaments and to the first elongate strip, said first and second elongate strips being wider than the flat array of multiple filaments of the second secondary strap winding forming a margin of two strips of adhesively bonded tape along the sides of the second secondary strap winding extending beyond the outside filaments of the second secondary strap winding thereby increasing distance over material surfaces between separate winding layers, the multiple filaments of the second secondary strap winding being maintained in substantially equal spaced relationship relative to each other without crossover and relative to the turns of the primary winding over the compound curvature and uneven surfaces of the layers around the toroidal core thereby optimizing mutual inductance between the primary winding and the second secondary strap winding and minimizing leakage inductance.

4,631,512

VOLTAGE DIVIDING RESISTOR DEVICE

Hideo Hishiki, and Yukio Kamiyama, both of Iwai, Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Jun. 1, 1984, Ser. No. 616,471
Claims priority, application Japan, Jun. 3, 1983, 58-84945[U]
Int. Cl.⁴ H01C *10/16*
U.S. Cl. 338—48 9 Claims



1. A voltage dividing resistor device comprising:

a substrate (**30**);

first through third electrodes (**31***a*, **31***b*, **31***d*) printed on said substrate;

a group of resistor bodies (R_{V_0}, R_2, R_{20}, R_{V_f}, R_{10}, R_1) printed on said substrate, said group of resistor bodies at least comprising first through third resistor bodies (R_{10}, R_{V_f}, R_{20}) connected in series so that one end of said first resistor body (R_{10}) is coupled to said first electrode (**31***a*) and one end of said third resistor body (R_{20}) is coupled to said third electrode (**31***d*) with said decond resistor body (R_{V_f}) connected between said first and third resistor bodies, said first and third resistor bodies having mutually identical lengths and resistances;

a conductive member (**25**) coupling said second electrode (**31***b*) with a predetermined point on said second resistor body (R_{V_f}), a first desired divided voltage (V_f) being obtained across said second and third electrodes (**31***b*, **31***d*) when a predetermined voltage (V) is applied across said first and third electrodes (**31***a*, **31***d*); and

first and second conductor parts (**32***a*, **32***b*), at least one of which is formed to be in a mutually overlapping relationship with a part of at least one of said first and third resistor bodies (R_{10}, R_{20}), respectively,

said first and second conductor parts having lengths thereof set depending on the value of said first desired divided voltage (V_f) so that an equation $X_1+X_2=1$ stands, where X_1 represents a ratio of the length of said first conductor part with respect to a length of said first resistor body and X_2 represents a ratio of the length of said second conductor part with respect to a length of said third resistor body,

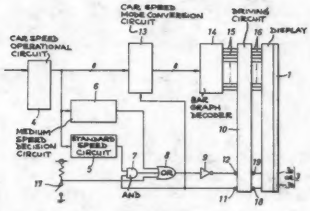
said group of resistor bodies having a fixed total length and a fixed pattern on said substrate independent of a value of said first desired divided voltage.

4,631,513

DISPLAY UNIT OF SPEEDOMETER FOR AUTOMOBILE

Tohru Teshima, Yokohama; Hidehiko Naete, Kawasaki, both of Japan, and Pierre H. Robert, Bougival, France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France and Stanley Electric Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1983, Ser. No. 484,580
Claims priority, application Japan, Apr. 20, 1982, 57-64874
Int. Cl.⁴ B60Q *1/00*
U.S. Cl. 340—52 R 2 Claims



1. A display unit of a speedometer for an automobile, comprising:

a car speed operational circuit adapted to receive signals corresponding to car speed for producing and transmitting corresponding output signals;

a set standard decision circuit coupled to said output signals of said car speed operational circuit for determining when car speed exceeds a set standard speed and for producing a corresponding output;

a set medium speed decision circuit coupled to said output signals of said car speed operational circuit for determining when car speed exceeds a set medium speed and for producing a corresponding output;

an OR circuit having plural inputs and an output, including a first input coupled to said output of said set medium speed detector;

an AND circuit having a first input coupled to an output of said set standard decision circuit, a second input coupled to said output of said OR circuit, and an output coupled to a second input of said OR circuit;

display means for displaying car speeds in at least two scale modes including a standard scale mode and an enlarged scale mode, including a bar graph display including plural display segments, a scale display, and a driving circuit for selectively driving said segments and said scale display; and

a car speed mode conversion circuit coupled to said output signals of said car speed operational circuit for converting said output signals thereof to display signals and applying said display signals to said driving circuit, said conversion circuit having a control input coupled to the output of said OR circuit for controlling whether said display signals are operative to produce a standard scale display in said standard mode or an enlarged scale display in said enlarged scale mode based on the output of said OR circuit and which operates in a hysterisis mode;

said OR circuit output coupled to said driving circuit to control the scale display to display scale as either a standard scale or an enlarged scale.

4,631,514

MALFUNCTION DETECTION ARRANGEMENT FOR JERK CONTROLLED BRAKE COMMAND SYSTEM

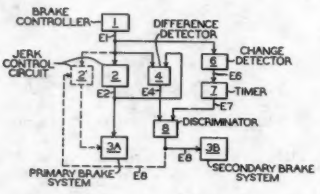
Tatsuo Fujiwara, Kobe, Japan, assignor to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Apr. 8, 1985, Ser. No. 720,773

Claims priority, application Japan, Apr. 26, 1984, 59-62751[U]

Int. Cl.[4] B60Q *1/00*; B60T *13/70*; B61B *13/16*

U.S. Cl. 340—52 R 13 Claims



1. A railway car brake control system comprising:

(a) brake controller means for providing a brake command signal according to the amount of braking desired;

(b) first means for modifying said brake command signal to provide a jerk control signal;

(c) primary brake means operative in response to said jerk control signal for providing smooth application of braking of said railway car;

(d) difference detector means for providing a difference signal anytime said brake command and said jerk control signals disagree;

(e) discriminator means subject to said difference signal for providing a malfunction signal;

(f) change detector means for providing a change signal anytime said brake command signal is varied; and

(g) timer means subject to said change signal for initiating a preset time period each time said brake command signal is varied, during which time period, said discriminator means is prevented from providing said malfunction signal, to thereby distinguish the temporary existence of said difference signal due to normal operation of said jerk control means from said difference signal due to abnormal operation of said jerk control means.

4,631,515

VEHICLE GEAR SHIFT INDICATOR

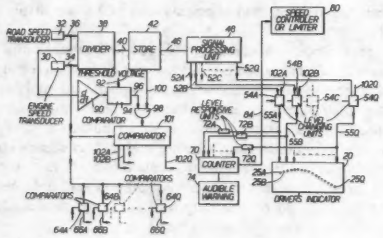
Timothy J. Blee, and Norman P. Deane, both of Rugby, Great Britain, assignors to AE PLC, Warwickshire, England

Filed Dec. 22, 1982, Ser. No. 452,083

Claims priority, application United Kingdom, Apr. 22, 1981, 8112478

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 340—62 14 Claims



1. An indicating system for use on a mechanically propelled vehicle having a driver-operated engine-driving wheels transmission system using a plurality of separate gears normally operable in an ascending or descending sequence and to indicate to the driver thereof when he should change from the particular one of the gears which is engaged at any time to the next gear in one of the sequences comprising

means responsive to the particular gear engaged to produce an electrical datum signal having a value representing a datum speed dependent on the identity of that gear,

indicating means comprising means operative in response to predetermined control signals to produce respective ones of a series of indications to the driver indicating with successively greater urgency that he should change to the next gear in the said sequence,

means responsive to the actual speed of the engine or of the vehicle to produce an electrical signal representing that speed,

control means responsive to the datum signal and to the electrical signal representing the actual speed and operative when the actual speed reaches the datum speed to produce a first one of the said control signals,

means feeding the first control signal to the indicating means to cause the indicating means to produce the first said indication in the said series,

means responsive to the datum signal and to the electrical signal representing the actual speed and connected to sense whether the driver changes to the said next gear in the sequence in response to the said first indication in the said series and, if he does not, to produce successive further said control signals as the actual speed exceeds the datum speed by a respective predetermined amount or amounts, and

means connected to feed the said further control signals to the indicating means to cause the indicating means to produce in succession the other indications in the said series,

the values of the datum signals being respectively predetermined so that the respective datum signals are such that respective gear changes at those speeds promote engine efficiency, the datum signals having values which are pre-calculated and are independent of the actual operation of the vehicle at any time.

4,631,516

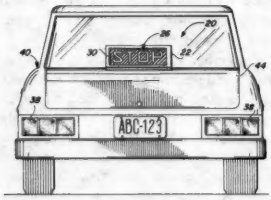
AUXILIARY VEHICLE WARNING SYSTEM

Gerald Clinker, 4647 Don Pio, Woodland Hills, Calif. 91364

Filed Sep. 3, 1985, Ser. No. 771,249

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 340—76 8 Claims



1. An information display system for vehicles, said system comprising, in combination:

(a) a housing containing a visual display means for providing a plurality of individually selectable messages,

(b) mounting means for removeably securing said display means to a vehicle,

(c) a multiple message display storage unit,

(d) sensor-discriminator means,

(e) pulse generation means capable of generating a plurality of different signals and which is adapted to be selectively activated by the operator of said vehicle said pulse genera-

tion means comprising existing electrical equipment for actuating standard vehicle functions, wherein the method of operation of the existing electrical equipment generates pulses,

(f) an electfical power source,

(g) electrical circuit means interconnecting said power source, said pulse generating means, said sensor-discriminator means, said multiple message display storage unit, and said visual display means,

(h) whereby the transmission of a particular signal from said pulse generation means to said sensor discriminator means will cause a predetermined message to be displayed on said visual display means.

4,631,517

FREQUENCY-MATCHED SIGNAL DEVICE FOR PERSONS WITH IMPAIRED HEARING

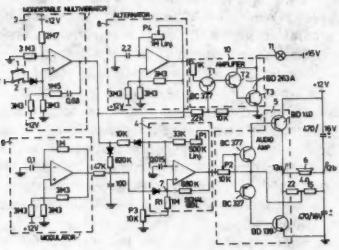
Kenth J. Ajland, Riddarvagen 74, S-184 02 Osterskar

Filed Nov. 28, 1980, Ser. No. 211,338

Claims priority, application Sweden, Nov. 30, 1979, 7909920

Int. Cl.⁴ G08B 3/10

U.S. Cl. 340—326 **8 Claims**



1. A frequency-matched signal device for a person with impaired hearing, but whose right and left ears do not have identical hearing impairments, such that the person's hearing is sensitive to tones of two respective particular frequencies at substantially normal audio levels, comprising

an acutator for selectively initiating operation of the device;

signal generating means activated by said actuator for generating alternating first and second audio tones; and

output transducer means providing an acoustic signal in response to said audio tones; wherein

said signal generating means includes

an audio signal generator providing an electrical audio tone,

first freely and continuously adjustable means for selectively setting the fundamental frequency of said electrical audio tone emitted thereby to the higher of the two particular frequencies to which the hearing of the person with impaired hearing is sensitive;

second freely and continuously adjustable means coupled to said audio signal generator for selectively setting the fundamental frequency of said second audio tone emitted thereby, without disturbing the setting effected by the first adjustable means, to the lower of said two particular frequencies, the second adjustable means being freely adjustable from the higher of the two particular frequencies downward over a range of three octaves; and

an alternator coupled to the signal generator for causing the electrical output signal of the signal generator to alternate between said two particular frequencies at a predetermined slow rate.

4,631,518

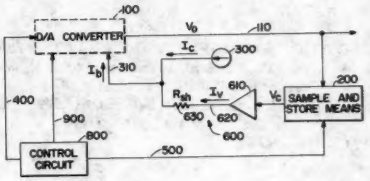
DIGITAL-TO-ANALOG CONVERTER BIASING CONTROL CIRCUIT

George J. Caspell, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 24, 1984, Ser. No. 653,617

Int. Cl.⁴ H03K 13/02

U.S. Cl. 340—347 DA **10 Claims**



1. The method of operating a device for controlling the output voltage range of a digital-to-analog converter including means for sampling and storing an output voltage of the digital-to-analog converter and means to bias the voltage range of the digital-to-analog converter in accordance with the stored value, said method comprising:

storing said output voltage in said sampling and storing means,

biasing the voltage range of the digital-to-analog converter in accordance with a controlled current proportion to the stored value in combination with a predetermined constant current to provide a new output voltage, and

successively sampling and storing a new output voltage value and using the same to bias said voltage range until a desired voltage range is achieved.

4,631,519

POSITION MEASURING APPARATUS

James S. Johnston, Bognor Regis, England, assignor to Rosemount Engineering Company Limited, England

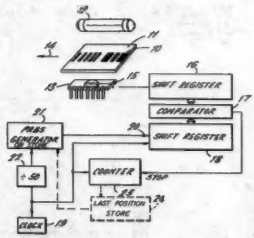
PCT No. PCT/GB83/00215, § 371 Date Apr. 20, 1984, § 102(e) Date Apr. 20, 1984, PCT Pub. No. WO84/01027, PCT Pub. Date Mar. 15, 1984

PCT Filed Sep. 1, 1983, Ser. No. 606,814

Claims priority, application United Kingdom, Sep. 1, 1982, 8224888

Int. Cl.⁴ H03M 1/22

U.S. Cl. 340—347 P **23 Claims**



1. Position measuring apparatus for determining the relative position of two relatively movable members comprising markings forming regularly spaced code elements on one member extending in the direction of relative movement and defining a pseudo-random binary sequence (PRBS), and detecting means on the other member for sensing said markings, said detecting means being arranged to sense markings in a sufficient number of successive code elements, which number is less than the full

length of the PRBS, to define a unique position along the PRBS and thereby give a coarse unambiguous position determination, and said detecting means further being arranged to sense the positions of transitions or edges of markings in a plurality of successive code elements to define a fine position within the length of a code element.

4,631,520

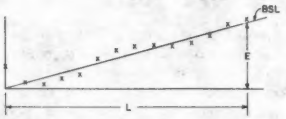
POSITION ENCODER COMPENSATION SYSTEM

Sidney A. Wingate, Concord, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed Jun. 8, 1984, Ser. No. 618,509

Int. Cl.[4] H03K *13/02, 13/18*

U.S. Cl. 340—347 CC **15 Claims**



9. A position encoder having a scale and a head relatively movable along the scale;

means for providing sinusoidal encoder signals representing the position of the head relative to the scale;

means for compensating for scale error comprising:

means operative in response to the encoder signals for providing a signal indication of each predetermined increment of relative motion;

means for providing phase correction signals representing an error function of the scale; and

means operative in response to the signal indication to combine the phase correction signal with the encoder signals and provide output signals compensated for scale error.

4,631,521

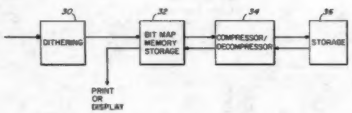
METHOD AND APPARATUS FOR DIFFERENTIAL RUN-LENGTH CODING

Ahmed M. El-Sherbini, Giza, Egypt, assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Dec. 31, 1984, Ser. No. 687,629

Int. Cl.[4] H03K *13/22;* H04N *1/00*

U.S. Cl. 340—347 DD **22 Claims**



1. A method for data compression of binary bits representing the pixels of a dithered image in a digital imaging process comprising the steps of

in every scan line of pixels, differentiating between corresponding bits of bytes from a specified reference byte located in the scan line to be used unchanged in each differentiation and every other byte in the scan line to generate intermediate image data representing said dithered image, the original state of said reference byte being included in said imtermediate image data and

encoding said intermediate image data.

4,631,522

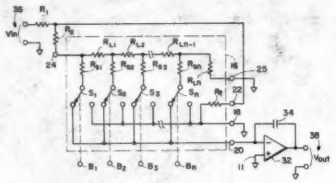
METHOD AND CIRCUIT FOR COMPENSATION OF A MULTIPLYING DIGITAL-TO-ANALOG CONVERTER

Richard C. Cabot, Beaverton, Oreg., assignor to Audio Precision, Inc., Beaverton, Oreg., a part interest

Filed Apr. 12, 1985, Ser. No. 722,858

Int. Cl.[4] H03K *13/02*

U.S. Cl. 340—347 CC **5 Claims**



1. A compensation circuit for reducing the effect of variations in resistance values of circuit elements within a multiplying digital-to-analog converter having a ladder resistor network comprising a plurality of first resistance elements connected together in series, with one end of said series providing a converter input connection and the other end of said series providing a reference connection, and a corresponding plurality of second resistance elements each connected at one end thereof to the input end of a respective first resistance element, a plurality of switch means, each connected to the other end of a respective second resistance element, for selectively connecting said second resistance elements to one of a first or a second output connection, and a feedback resistance element connected at one end to said first output connection and at its other end to a feedback connection, said converter having a converter input resistance defined as the resistance from said input connection to said reference connection with both said first and said second output connections connected to said reference connection, and a feedback resistance defined as the resistance from said feedback connection to said first output connection, said compensation circuit comprising:

(a) a first resistor connected at one end to said feedback connection, the other end providing a compensated circuit input connection; and

(b) a second resistor connected at one end to said feedback connection and at the other end to said converter input connection, said first output connection being connected to said reference connection, the product of the resistances of said first and second resistors being equal to the product of said converter input resistance and said feedback resistance, and said second output connection providing a compensated circuit output connection.

4,631,523

PULSE GENERATOR

Tadahiro Ono, Shizuoka, and Shigenori Igarashi, Susono, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha and Toei Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 11, 1985, Ser. No. 743,493

Claims priority, application Japan, Jun. 12, 1984, 59-120289

Int. Cl.[4] H03M *1/64*

U.S. Cl. 340—347 SY **7 Claims**

1. A pulse generator comprising:

(a) a driven body;

(b) a transducer coupled to said driven body for converting a mechanical motion thereof to a phase-modulated signal;

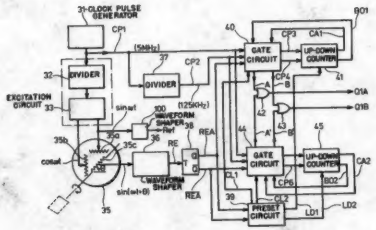
(c) excitation signal generating means for supplying an excitation signal as a carrier of the phase-modulated signal to said transducer;

(d) clock pulse generator means for generating a train of clock pulses;

(e) waveform shaping means for shaping the waveform of the phase-modulated signal issued from said transducer;

(f) counter means for receiving said clock pulses to form a content of count representing a time interval by which the output from said waveform shaping means being in a high or low logical state is longer or shorter than the corresponding period of said excitation signal;

(g) count pulse generator means for generating count pulses;



(h) gate means for allowing the count pulses to enter said counter means until said counter means having contents of count corresponding to said time interval is initialized while the output from said waveform shaping means is in its succeeding logical state; and

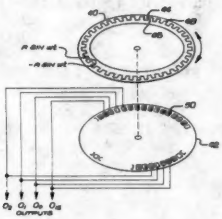
(i) output gate means for allowing the count pulses counted by said counter to issue out as a serial train of pulses.

4,631,524

CAPACITIVE ENCODER HAVING MULTIPLE PRECISION OUTPUTS

Raymond Brooke, Calabasas, and Gaston Palombo, Agoura, both of Calif., assignors to Computer Memories, Inc., Chatsworth, Calif.

Filed May 2, 1983, Ser. No. 490,571
Int. Cl.[4] G08C 9/02
U.S. Cl. 340—347 P **10 Claims**



1. A high resolution capacitive encoder, comprising:

a first plate having first and second conductive input areas formed thereon, wherein the input areas are separated by a square wave shaped gap having a wavelength C_p;

a second plate whose surface is spaced a predetermined distance from the surface of the first plate for capacitive coupling therebetween, said plates being movable with respect to each other, said second plate including a series of rectangular conductive output areas positioned in facing relation to the gap along the length thereof, each of said output areas having a length equal to one half of the wavelength of the gap and being spaced from adjacent output areas by a distance C_p/N, where N is an integer greater than 2;

means for applying a first periodic signal to the first input area;

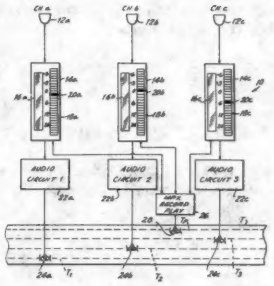
means for applying a second periodic signal which is the inverse of the first signal to the second input area, wherein the first and second signals will capacitively couple to the output areas to provide an output signal at each output area, whereby the maximum amplitude of each output signal will vary linearly as the first and second plates move with respect to each other and will have a null value when equal portions of the respective output area are capacitively coupled to the first and second input areas, wherein N null outputs are generated as the plates move with respect to each other by an amount C_p.

4,631,525

DIGITAL FADER OR LIKE DEVICE

Joseph M. Serravalle, Jr., Boca Raton, Fla., assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 11, 1983, Ser. No. 483,856
Int. Cl.[4] G08C 9/02
U.S. Cl. 340—365 S **26 Claims**



1. Apparatus comprising a plurality of channels of audio signals and, in association with each of said channels, a touch-sensitive strip having first and second overlying portions are of which is relatively flexible with respect to the other so as to contact said other portion at a location corresponding to the position of an operator's finger thereon; detecting means for detecting said contact and for detecting said contact and for producing a signal in response thereto; and encoding means coupled to said detecting means for encoding said produced signal into a digital signal representing said contact location, whereby each of said channels can be faded independently of the others by movement of the operator's finger; wherein one of said overlying portions of said touch-sensitive strip is provided with multiple discrete conductive elements and the other portion is provided with a reference potential which is coupled to at least one conductive element as a function of the particular location of contact of said portions.

4,631,526

THEFT PROOF ALARM BELL ASSEMBLY

John C. Marsh, East Molesey, United Kingdom, assignor to Automated Security Holdings, Ltd., United Kingdom

Continuation of Ser. No. 386,771, Jun. 10, 1982, abandoned.
This application Dec. 20, 1985, Ser. No. 815,175
Int. Cl.[4] G08B 3/00
U.S. Cl. 340—396 **11 Claims**

1. An alarm bell assembly including an alarm bell and comprising:

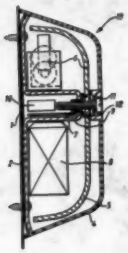
a supportive base;

a gong;

securing means for attaching said gong to said supportive base;

a plurality of alarm bell components concealed beneath and protected by said gong; and

detector means suitably designed and cooperatively arranged with said securing means for actuating said alarm



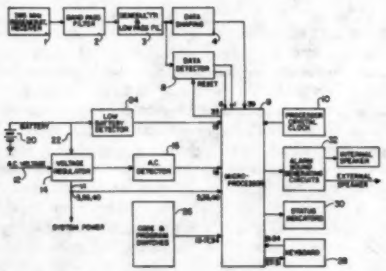
bell in response to attempts to tamper with said gong by removal of said securing means.

4,631,527

TRANSMITTER-RECEIVER CODED SECURITY ALARM SYSTEM

Kenneth I. De Witt, Phoenix, and Michael L. Kovens, Randallstown, both of Md., assignors to Universal Security Instruments, Inc., Owings Mills, Md.

Filed Nov. 25, 1980, Ser. No. 210,477
Int. Cl.[4] G08B 1/08
U.S. Cl. 340—539 **24 Claims**



1. A transmitter-receiver burglar alarm system comprising

a battery powered transmitter unit including a transmitter of radio waves,

means for sensing a low battery voltage at said transmitter unit,

said transmitter unit having means for transmitting a low battery voltage signal, and means for transmitting a channel selecting code bit,

means connected to the transmitter unit for preventing said transmitter unit from making further transmissions after transmitting said low battery voltage signal,

a base station including a receiver for receiving radio waves transmitted by said transmitter unit,

said base station having means responsive to transmission of said channel selecting code bit to provide a first audible sound and responsive to the absence of said channel selecting code bit to produce a second audible sound,

said base station further including at will actuatable means responsive to receipt of said channel selecting code bit for producing a third audible sound, and

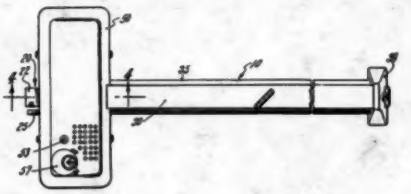
means responsive to said low battery voltage signal for producing a fourth audible sound.

4,631,528

PUSH BAR EXIT DEVICE WITH ALARM

Martin G. Handel, Newington; James E. Robida, Middletown, and Ronald S. Slusarski, Berlin, all of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Oct. 2, 1984, Ser. No. 656,828
Int. Cl.[4] G08B 13/08; E05B 65/10
U.S. Cl. 340—545 **12 Claims**



1. An improved exit device for doors, said device including a frame, a push bar mounted to the frame for relative movement between an extended position and a depressed position, and a latch bolt assembly at one end of the frame having mechanisns for retracting the latch bolt in response to the movement of said push bar toward its depressed position, in which the improvement comprises:

an alarm assembly including an electrically actuated alarm, means for actuating the alarm in response to the movement of said push bar, and means for controlling the actuation of said alarm in response to an externally operable switch;

a housing for said alarm assembly which contains its elements and shields them from manipulation; and

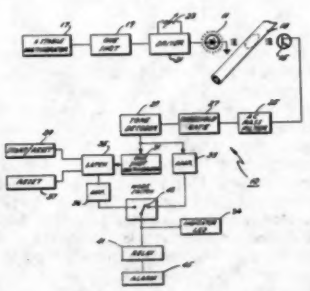
means for fastening the alarm housing to said frame, with said push bar when in its extended position shielding said fastening means and when in its depressed position, permitting access to said fastening means to permit separation of said alarm housing from said frame.

4,631,529

ELECTRO-OPTICAL FLUID DETECTOR

Vernon Zeitz, Springfield, Vt., assignor to Ivek Corporation, Springfield, Vt.

Filed Oct. 17, 1984, Ser. No. 661,638
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—619 **19 Claims**



1. An electro-optical fluid detector capable of sensing the presence and absence of fluid in a clear tube, comprising:

means for pulsing a light emitting source at an adjustably fixed repetition rate and pulse duration, said means including a light source, said light emitted therefrom being shaped into a narrow beam 0.050 inches in diameter;

photo sensing means for detecting said light beam from said

emitting source, said sensing means including a photo transistor operating in its unsaturated active switching region of operation, said detecting means generating an alarm signal;

tone decoder means for reacting to a pre-determined frequency of said pulsed light connected to said sensing means; and

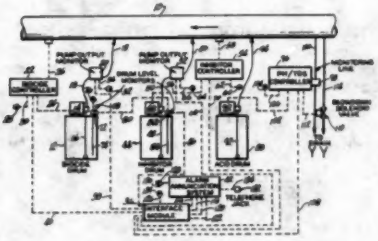
wherein said clear tube is disposed to intercept said emitted narrow beam of light.

4,631,530

CHEMICAL PROCESS MONITOR

Kenneth E. Gasper, Leawood, Kans., assignor to Olin Corporation, Cheshire, Conn.

Filed Apr. 2, 1984, Ser. No. 595,776
Int. Cl.⁴ G08B 21/00
U.S. Cl. 340—679 **17 Claims**



1. A monitor system for simultaneously monitoring both chemical process parameter control means and adjustment means for adjusting the controlled process parameter comprising:

(a) adjustment means for adjusting a chemical process parameter;

(b) control means for sensing said chemical process parameter and for generating a first output signal to said adjustment means when a predetermined condition exists, said first output signal capable of causing a positive response in said adjustment means;

(c) monitoring means for sensing whether said adjustment means made a positive response to said first output signal from said control means and for generating a second output signal as evidence of said positive response; and

(d) interrogation means for sensing both said first and second output signals and for performing an interrogation, said interrogation comprising:

(i) when said second output signal is not sensed within a predetermined time period after the beginning of said sensing of said first output signal, then an alarm signal is generated to an alarm annunciating means; and

(ii) when said second output signal is sensed within said predetermined time period after the beginning of said sensing of said first output signal, then no alarm signal is generated to said alarm annunication means.

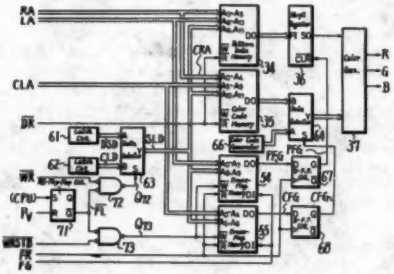
4,631,531

SYSTEM FOR TEXT DISPLAY WITH PLURAL PAGE MEMORY AND FLAG MEMORY

Satoru Maeda, Yamato, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP82/00333, § 371 Date Apr. 26, 1983, § 102(e) Date Apr. 26, 1983, PCT Pub. No. WO83/00789, PCT Pub. Date Mar. 3, 1983
PCT Filed Aug. 24, 1982, Ser. No. 491,205
Claims priority, application Japan, Aug. 27, 1981, 56-134582
Int. Cl.⁴ G09G 1/28
U.S. Cl. 340—701 **3 Claims**

1. An image display apparatus comprising image memory means having plural display areas corresponding to areas of a visual display and for storing image signals of plural pages, each page being formed of a plurality of packets of data, and read out means for reading out said image signal in said image memory means and supplying it to an image display means for visual display, in which said image memory means includes a pattern memory for storing plural line data of the image to be displayed, and said image display apparatus further comprises flag memory means having plural flag areas corresponding to respective ones of said plural display areas of said image memory means and in which said plural flag areas include plural line flag areas corresponding to each line of said image to be



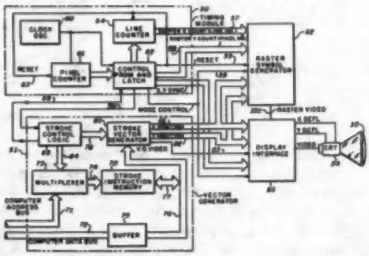
displayed, flag control means for setting a flag of a corresponding display area to a first value when an erase code contained in one of said plurality of packets is received and setting said flag to a second value when an image signal contained in said plurality of packets is received, and read out control means for controlling said read out means so as to supply a blank signal instead of the image signal of said corresponding display area to said image display means when said corresponding flag is set to said first value, and to supply the image signal in said corresponding display area to said image display means when said corresponding flag is set to said second value.

4,631,532

RASTER DISPLAY GENERATOR FOR HYBRID DISPLAY SYSTEM

Steven P. Grothe, Glendale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Apr. 2, 1984, Ser. No. 595,810
Int. Cl.⁴ G09G 1/28
U.S. Cl. 340—703 **8 Claims**



1. Apparatus for superposing a raster symbol diaplay and a vector symbol diaplay on a cathode ray tube viewing screen, comprising:

clock means for providing timing signals for said raster symbol display and said vector symbol display, said clock means comprising:

(a) a clock pulse source, for generating regular timing pulses at a predetermined repetition rate,

(b) first digital counting means responsive to said regular clock pulses for providing a first digital count signal in accordance therewith,

(c) logic means responsive to said first digital count signal for providing digital signals for synchronizing displacements of a plurality of sequentially disposed raster lines comprising said raster symbol display along first and second display axes, and further providing said first digital count signal to programmable raster symbol generating means, and

(d) second digital counting means coupled to receive signals derived from said logic means for providing a second digital count signal representative of displacements along one of said display axes to said programmable raster symbol generating means, said first digital count signal and said second digital count signal having relative output frequencies in accordance with a predetermined ratio,

programmable vector generating means responsive to said clock means and coupled to said raster symbol generating means for providing positional signals representing a stroke vector of predetermined length, origin, and slope, said vector comprising a plurality of sequential picture elements defining positional and color data for regions of predetermined colors,

said programmable raster symbol generating means including memory means for storing an incremental location corresponding to a color change of ones of said raster lines, thereby providing at least one of said regions of predetermined colors defined by said stroke vector and said plurality of raster lines, and

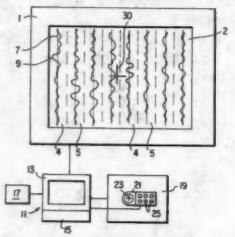
display interface means coupled to said raster symbol generating means and said vector generating means for alternately providing raster information and stroke vector information to said cathode ray tube viewing screen.

4,631,533

DISPLAY OF EDDY CURRENT DETECTOR DATA

Richard H. Mark, Jr., Pitcairn, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 15, 1984, Ser. No. 621,002
Int. Cl.[4] G09G *1/06*
U.S. Cl. 340—721 **9 Claims**



1. A method for producing a display of eddy current test data from signals produced by an eddy current detector which is supplied with an alternating current signal composed of alternating currents at several different frequencies, the detector signals including a respective signal associated with each alternating current and varying in amplitude and in phase relative to its associated alternating current as the detector is displaced along a selected path relative to a test body, comprising:

generating, from each detector signal, a data signal representing the detector signal component in phase with the alternating current associated with that detector signal and a data signal representing the detector signal component in quadrature with the alternating current associated with that detector signal;

storing a representation of each data signal; and

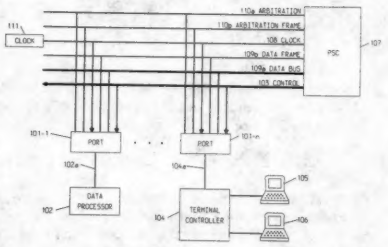
supplying the representation of each data signal to a display device for producing a first display composed of visible representations of all data signals along parallel reference axes, with each reference axis being associated with a respective data signal and being representative of the selected path of movement of the detector relative to the test body.

4,631,534

DISTRIBUTED PACKET SWITCHING SYSTEM

Andrew D. Franklin, Boulder, Colo.; Lloyd A. Hasley, Carrollton, Tex., and James E. Smith, Palo Alto, Calif., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed Nov. 13, 1984, Ser. No. 670,981
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.5 **10 Claims**



1. In a packet switching system having a plurality of ports interconnected by a data bus:

a system controller connected by a control bus and by said data bus to all of said ports,

at least one station connected to each of said ports,

means for applying call establishment information to a calling one of said ports from a connected calling station with said information including a called station number and a number identifying said calling station and a calling station off-hook indication signifying the initiation of a call,

means in said calling port for transmitting information identifying said calling and called station to said controller, said controller being responsive to the receipt of said information for applying destination port and called station addresses over said control bus to said calling port,

means in said calling port for subsequently receiving further information from said calling station with said further information including said calling station identification number as well as data to be transmitted over said data bus to said destination port and called station,

means in said calling port responsive to the receipt of said further information for translating said received calling station identification number into said destination port and called station addresses,

means in said calling port responsive to said translation for forming a packet comprising said data as well as said destination port and called station addresses, and

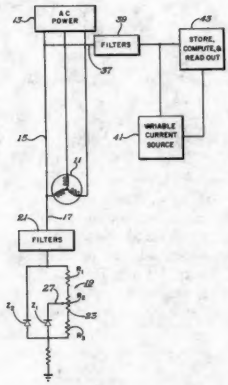
means for applying said formed packet to said data bus for transmission to said destination port.

4,631,535

SUBMERSIBLE PUMP PRESSURE DETECTION CIRCUIT

Duncan M. Butlin, Tulsa, Okla., assignor to Hughes Tool Company, Houston, Tex.

Filed Jul. 5, 1985, Ser. No. 751,824
Int. Cl.[4] G01L 9/02
U.S. Cl. 340—856 4 Claims



1. In a submersible well pump system having a downhole electrical motor for driving the pump, an improved means for measuring a fluid property in the environment of the well, comprising in combination:

a downhole potentiometer having a resistor connected to a transmission line linked to the surface and engaged by a wiper connected to ground, the wiper being movable along the resistor in response to changes in the fluid property;

a first downhole blocking means connected to the wiper between the wiper and ground for blocking current flow until a selected power level B is reached;

a second downhole blocking means connected to the transmission line above the resistor and to ground for blocking current flow until a selected power level C is reached that is greater than the power level B;

means at the surface for providing a power level A, which is below power levels B and C, to the transmission line, providing current which passes through the resistor to ground and is blocked by the first blocking means, for providing the power level B to the transmission line, providing current which passes through the upper portion of the resistor above the wiper and through the first blocking means to ground, and for providing the power level C which passes through the second blocking means to ground; and

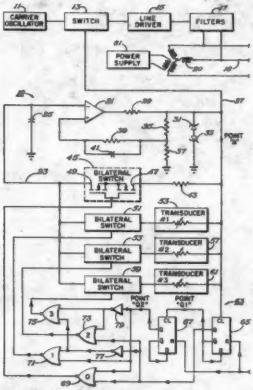
means at the surface for monitoring the voltage and current at the surface during each of the power levels, and for computing with the monitored voltage and current, the position of the wiper on the potentiometer resistor.

4,631,536

MULTIPLEX SUBMERSIBLE PUMP TELEMETRY SYSTEM

Donald H. Ward, Glen Ellyn, and James R. Tomashek, Wood Dale, both of Ill., assignors to Hughes Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 376,792, May 10, 1982, Pat. No. 4,581,613. This application Oct. 14, 1983, Ser. No. 541,939
The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.
Int. Cl.[4] G01V 1/40
U.S. Cl. 340—857 4 Claims



4. In a pump installation having a power cable for delivering AC power from a power source at the surface to an AC motor located in a well, measuring means for monitoring at the surface physical parameters in the environment of the motor, comprising in combination:

a downhole assembly located in the well in the vicinity of the motor and having a transmitter means for generating a carrier signal and for superimposing the carrier signal onto the power cable;

switching means for switching the carrier signal on and off the power cable;

a plurality of transducer means in the downhole assembly, each for providing a variable resistance corresponding to a physical parameter of the motor environment;

modulating means in the downhole assembly for charging a capacitor, then discharging the capacitor through a synchronizing resistance to turn on and off the switching means for equal duration corresponding to the synchronizing resistance, to provide the carrier signal with a synchronizing envelope that has an on and off duration corresponding to the synchronizing resistance;

downhole sequencing means in the downhole assembly for swithing each of the transducer means separately to the modulating means in place of the synchronizing resistance to provide the carrier signal with data envelopes with on and off duration corresponding to the resistance of the transducer means, the downhole sequencing means being triggered by the switching of the switching means;

the synchronizing resistance being selected to provide a synchronizing envelope of duration less than the duration of any of the data envelopes;

a plurality of readout means at the surface, each corresponding to one of the transducer means, for converting each of the data envelopes to a readout signal proportional to the parameter sensed;

surface sequencing means at the surface for sequentially turning on each of the readout means for the duration of each of the data envelopes, the surface sequencing means

being triggered by the receipt of one of the data envelopes; and

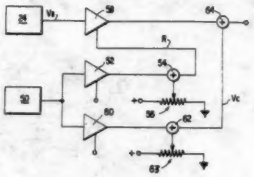
synchronizing means at the surface for detecting the synchronizing envelope and for resetting the sequencing means upon receipt of the synchronizing envelope, to assure that each of the readout means is turned on by its respective data envelope.

4,631,537

METHOD FOR TEMPERATURE COMPENSATING A ROD POSITION INDICATION SYSTEM

James A. Neuner, Richland Township, Lebanon County; Dirk J. Boomgaard, Monroeville; Susan A. Wilbur, Wilkins Township, Allegheny County, and Charles G. Geis, N. Huntington, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 2, 1984, Ser. No. 606,421
Int. Cl.[4] G08C *19/08*
U.S. Cl. 340—870.17 **4 Claims**



1. A method for temperature compensating a position indicator which includes a sensor for producing an output signal whose magnitude corresponds to the position of an element that is linearly movable between first and second positions and which is subject to changes in temperature within a given temperature range, wherein the output signal of the sensor contains a temperature variable offset component and the rate of increase of the output signal as the element moves from the first to the second position fluctuates with changes in temperature, comprising the steps of:

monitoring the temperature of the element;

generating an electrical representation of an offset correction, relative to a reference temperature, required for the offset component of the output signal of the sensor at the temperature of the element;

generating an electrical representation of a rate correction factor, relative to a reference temperature, required for the rate of increase in the output signal of the sensor at the temperature of the element;

causing the sensor to produce an output signal corresponding to the position of the element; and

compensating the output signal of the sensor by forming an electrical representation of the product of the sensor output signal and the rate correction factor required at the temperature of the element, and adding to such product the offset correction required at the temperature of the element.

4,631,538

SINGLE FREQUENCY MULTITRANSMITTER TELEMETRY SYSTEM

Victor A. Carreno, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

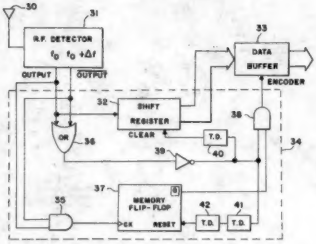
Filed Feb. 28, 1983, Ser. No. 470,113
Int. Cl.[4] G08C *19/16*
U.S. Cl. 340—870.18 **10 Claims**

1. A single frequency multitransmitter telemetry system comprising:

a plurality of sensors with each sensor at a different location;

a plurality of transmitters with each transmitter connected to the output of one of said sensors for transmitting the output of the sensor;

each of said transmitters including means for modulating the output of its sensor in frequency shift keying with frequencies f_o and $f_o+\Delta f$ so that all of said transmitters, when transmitting, transmit one or the other of said frequencies; and



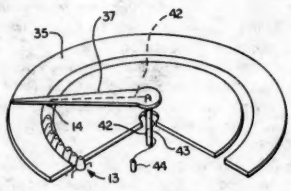
a receiver means including a single receiver input for receiving from all of said transmitters the modulated outputs from said sensors, said receiver means further comprising means for accepting data from said transmitters only one transmitter is transmitting and for discarding data from the transmitters when more than one transmitter is transmitting.

4,631,539

DIGITAL POINTER POSITION DETECTOR

Gary G. Sanders, Lakewood, and Michael E. Corwon, Parma, both of Ohio, assignors to The Scott & Fetzer Company, Cleveland, Ohio

Filed Jan. 19, 1983, Ser. No. 459,262
Int. Cl.[4] G08C *9/06, 19/36*
U.S. Cl. 340—870.29 **11 Claims**



1. An indicating gauge or meter of the scalar dial type with an indicator pointer whose position may be signalled with acceptable resolution and with negligible torsional mechanical loading of the pointer or associated pointer linkage, said indicating gauge comprising: said pointer, an arcuate or linear indicator scale along which said pointer moves, an array of LED's arranged along said scale and each having its own unique address, said array of LED's being of a high linear density corresponding to acceptable resolution for indicator scale readings, a photodetector mounted as a unitary part of said indicator pointer to sweep as a part of the pointer itself back and forth in both directions over said high density array of LED's according to the movements of said pointer, means for cyclically sequentially lighting the LED's for single point transmission independently of said pointer's position and correspondingly counting through the addresses of LED's being lighted, on a one-to-one basis of single point activation to instantaneously-current count, whereby each said LED in said

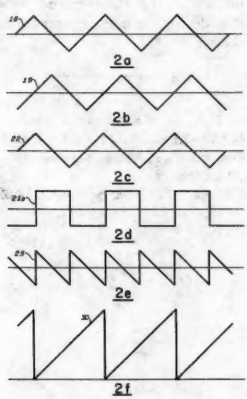
high-linear density single point transmission array is lighted only for the instant that its unique address is the instantaneously-current count, buffer means responsive to activation of said photodetector for latching the count corresponding to the pointer's then-obtained position as the sequential lighting of the LED's cycles to or past the photodetector whereby the then-obtained position of said pointer defines the value of said latched count and the defined value of the latched count identifies pointer position with a degree of resolution acceptable for indicator gauge readings.

4,631,540

ANGULAR POSITION TO LINEAR VOLTAGE CONVERTER

Alan Feldman, Phoenix, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Jun. 3, 1985, Ser. No. 740,602
Int. Cl.[4] G08C *19/04*
U.S. Cl. 340—870.38 **8 Claims**



1. Apparatus to convert angular position to linear voltage comprising:

angular position means for generating a first and second cyclical voltage waveform, said waveforms being disposed at a predetermined angular separation from one another,

waveform converting means for receiving said first and second cyclical waveforms and for providing therefrom a waveform that is an inverted representation of said first cyclical voltage waveform when said second cyclical voltage waveform is negative and a direct representation of said first cyclical waveform when said second cyclical waveform is positive, and

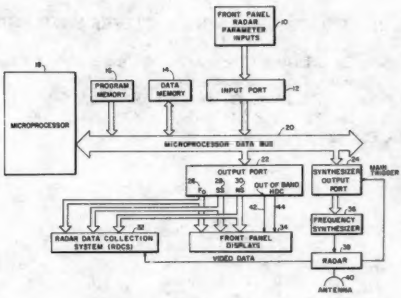
means for summing output of said waveform converting means and a predetermined d.c. voltage for providing a linear positive going ramp waveform representative of said angular position voltage generating means.

4,631,541

MICROPROCESSOR BASED PROGRAMMABLE FREQUENCY CONTROLLER FOR FREQUENCY AGILE RADAR

Michael J. Prickett; Murray H. Mott, both of San Diego, and Nicholas Panos, El Cajon, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 8, 1983, Ser. No. 559,576
Int. Cl.[4] G01S *7/42, 13/26*
U.S. Cl. 343—5 DP **25 Claims**



1. A programmable stepped frequency controller for frequency agile radar which comprises:

means for receiving input radar control parameters, said control parameters being entered by the system operator;

means for retaining a computer program, said computer program constructed to provide operational control and data transfer management directions for the system;

means for storing data, said storing means being able to receive or transmit data pertaining to the operation of the frequency agile radar system;

means for processing and controlling, said processing means capable of executing the computer program contained in the retaining means, of processing data during operation of the radar system, and of controlling the operation of the frequency agile system;

means for transceiving data and operational commands between the components of the programmable frequency controller, said transceiving means being connected to receive signals from the receiving means, and the retaining means, being connected to send and receive data signals from the storing means, and being connected to receive and send control and data signals to the processing means;

means for synthesizing a radar signal to control the method of radar transmission from a radar system and antenna, said synthesizing means attached to the transceiving means for receiving control and data signals from the processing means to creae a predetermined frequency, bandwidth, and repetition rate radar signal;

means for outputting data information, said outputting means being connected to receive the data information from the transceiving means as controlled by the processing means, and said data including operational information for the frequency agile radar system;

means for displaying the data information outputted to the outputting means, said displaying means being connected to the outputting means to receive said data; and

means for collecting said data information, said colecting means connected to receive select data from the outputting means and also connected to receive select data from the radar system, and said collecting means capable of holding said data for further processing;

wherein the means for receiving input control parameters comprises:

a plurality of adjustable switches for selectably setting the

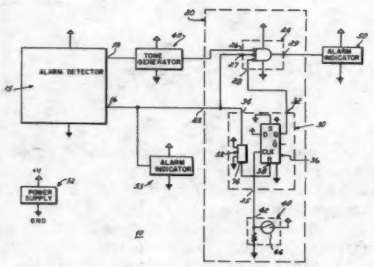
control radar parameters which include the initial frequency of the output sequence of frequency bursts, the step size of the incremental value of frequency added to the latest frequency output to produce the next frequency burst in the output sequence, the total number of different frequency bursts in the output sequence, the mode for the output sequence, the type of radar band to be used for the output sequence of frequencies, a restart function to initiate new sequences, the radio-frequency pulse width for each frequency burst, and an unambiguous maximum range parameter.

4,631,542

POLICE RADAR WARNING RECEIVER WITH MUTE FUNCTION

Richard L. Grimsley, Cincinnati, Ohio, assignor to Cincinnati Microwave, Inc., Cincinnati, Ohio

Filed Sep. 28, 1984, Ser. No. 656,029
Int. Cl.[4] G01S *7/40*; H04B *17/00*; G08B *7/00*
U.S. Cl. 342—20 **16 Claims**



2. A method of controlling a vehicle-mounted police radar detector alarm indicator comprising:

generating an alarm signal in response to detectable presence of a police radar signal;

energizing an alarm indicator in response to initial generation of said alarm signal;

selectively generating a mute signal while said alarm indicator is energized;

de-energizing the alarm indicator in response to said mute signal;

continuing to de-energize the alarm indicator until a predetermined time after the alarm signal terminates;

terminating the alarm signal in response to the termination of the detectable presence of police radar signal whereby a subsequent detectable presence of a police radar signal will again generate an alarm signal but will not energize the alarm indicator unless the alarm signal is again generated after said predetermined time.

4,631,543

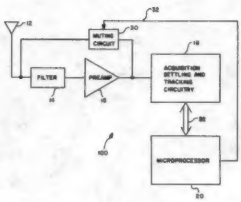
METHOD AND APPARATUS FOR REDUCING THE EFFECTS OF IMPULSE NOISE IN LORAN-C RECEIVERS

Lester R. Brodeur, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Sep. 28, 1983, Ser. No. 536,479
Int. Cl.[4] G01S *1/24*
U.S. Cl. 342—389 **15 Claims**

1. Apparatus for reducing the effects of impulse noise on the operation of a navigation receiver of the type that provides navigation information by receiving signals periodically transmitted by each of a plurality of navigation transmitters and measuring the difference in time of arrival of said signals from pairs of said navigation transmitters, the receiver having filter and amplifier means for filtering/amplifying the appropriate bandwidth of received signals, and acquisition/tracking means and microprocessor means for generating appropriately timed pulse output signals upon receiving the passed signals, and providing the navigation information from the time difference between the generation of said pulse signals, said apparatus comprising:

means associated with the microprocessor means for generating a time gate signal which defines a time period of



selected duration that preceeds the time of arrival at said receiver of said periodically transmitted signals, and

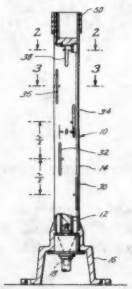
means in the front end of said receiver responsive to said time gate signal for attenuating signals received by said receiver prior to where the received signals are filtered and amplified during the time periods defined by said time gate signal.

4,631,544

S-BAND COAXIAL SLOT ARRAY ANTENNA

George Ploussios, Andover, Mass., assignor to Tideland Signal Corporation, Houston, Tex.

Filed Apr. 10, 1985, Ser. No. 722,097
Int. Cl.[4] H01Q *13/10*
U.S. Cl. 343—771 **4 Claims**



1. An S-band coaxial antenna comprising,

a body having an inner circular tube and a coaxial outer circular tube, the circumference of the outer tube being equal one wave length of S-band radar,

a plurality of pairs of axial elongated slots in the outer tube, the slots of each pair being diametrically opposed to each other, said adjacent pair of slots being axially displaced from each other a distance of one-half wave length,

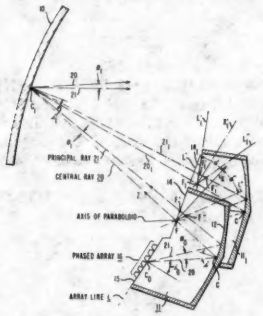
said pairs of slots being rotational offset at an angle equal to 360 divided by N, where N is the number of pairs, and a dielectric cover around the outer tube.

4,631,545

ANTENNA ARRANGEMENT CAPABLE OF ASTIGMATISM CORRECTION

Corrado Dragone, Little Silver, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 16, 1984, Ser. No. 671,975
Int. Cl.[4] H01Q *19/12*
U.S. Cl. 343—779 **10 Claims**



1. An antenna arrangement comprising:

an offset main reflector comprising a reflecting surface for reflecting a substantially planar wavefront impinging the reflecting surface in a predetermined direction from the far field of view of the antenna arrangement to an associated spherical reflected wavefront including first and second astigmatic phase centers which (a) increasingly separate in a direction away from a common focal point (F) on a focal plane of the main reflector along first and second focal lines, respectively, when the planar wavefront is moved, and (b) are located in respective first and second principal planes of curvature of the reflected wavefront; and

a feed arrangement comprising:

a parabolic cylindrical reflector including a parabolic reflecting curve in a plane of symmetry of the feed arrangement which corresponds to the first principal plane of the reflected wavefront from the main reflector, the reflector of the feed arrangement being disposed both (a) confocally with the common focal point (F) of the main reflector and along a reflected central ray from the far field of view of the antenna arrangement, and (b) relative to the main reflector for producing movable first and second astigmatic phase centers for rays in the plane of symmetry of the feed arrangement which correspond to locations of the first and second astigmatic phase centers when moving the planar wavefront in the first principal plane of the reflected wavefront, the first and second astigmatic phase centers being disposed on opposite sides of an axis (X) of the antenna arrangement in the first principal plane of the reflected wavefront which passes through the common focal point (F) and is orthogonal to the central ray, and

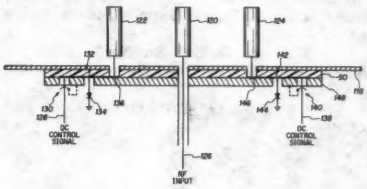
a phase array comprising N feed elements for providing a linearly scannable beam along the plane of symmetry of the feed arrangement, the N feed elements comprising an aperture thereof which is disposed to cover a predetermined portion of the image of the main reflector.

4,631,546

ELECTRONICALLY ROTATED ANTENNA APPARATUS

Ted A. Dumas, Dallas, Tex., and Les V. Griffee, Marysville, Kans., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 483,793, Apr. 11, 1983, abandoned. This application Jan. 14, 1985, Ser. No. 691,335
Int. Cl.[4] H01Q *3/44*
U.S. Cl. 343—833 **8 Claims**



1. Electronically signal direction oriented antenna means comprising, in combination:

ground plane means;

driven element means mounted on said ground plane means;

a plurality of parasitic elements, each of equal length and having a base portion juxtaposed said driven element means and mounted at the base portion on said ground plane means; and

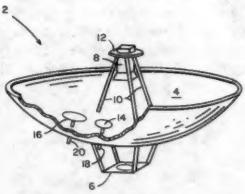
selector means, connected to one end of each of said parasitic elements below said ground plane means, for electrically and selectively altering the impedance at the base portion of said parasitic elements from director to reflector means by changing the impedance from capacitive to inductive while maintaining the same mechanical radiating length.

4,631,547

REFLECTOR ANTENNA HAVING SIDELOBE SUPPRESSION ELEMENTS

Daniel Jacavanco, Chelmsford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 25, 1984, Ser. No. 623,905
Int. Cl.[4] H01Q *19/19*
U.S. Cl. 343—840 **9 Claims**



1. In a directional antenna of the type having a substantially parabolic main reflector of electromagnetic energy and a feed horn positioned at the focal point of said main reflector characterized in that said antenna further comprises:

a plurality of energy reflecting elements affixed to the focusing surface of said main reflector and being entirely within the aperture of said main reflector;

each of said plurality of energy reflecting elements having its reflecting surface parallel to the tangent of said main reflector at the point where affixed to said main reflector; and

means for individually adjusting the penetration distance of said reflecting elements above the surface of said main

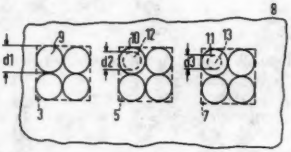
reflector to suppress selected sidelobes in the response pattern of said antenna.

4,631,548

MULTICOLOR INK JET PRINTER

Artur Milbrandt, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 23, 1985, Ser. No. 726,493
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1984, 3415825
Int. Cl.⁴ G01D *15/18*
U.S. Cl. 346—1.1 **4 Claims**



1. In a method of representing multi-colored characters employing a print head having a plurality of ink channels with discharge openings directed toward a recording meidum, each ink channel having a piezo-electric drive element for effecting a drop-by-drop ejection of ink from said ink channel to form picture points on said recording medium in response to drive pulses generated by a control circuit in accordance with characters or patterns to be represented, said drive pulses applied to each channel being selectable in terms of number, and in amplitude or duration to select the volume of ink in each drop, a plurality of ink supply reservoirs, each containing a primary color and supplying an individual one of said ink channels, and a drive mechanism for producing relative movement between said print head and said recording medium, the steps of;

applying a single discrete droplet to a first of said picture points and applying two or more discrete droplets to another of said picture points from different ones of said ink channels for the represention of mixed colors, and selecting drive pulses for said ink channels so that each picture point on said recording medium has a constant diameter, regardless of whether such picture point is composed of one discrete droplet of one primary color, or of a plurality of discrete droplets of different primary colors.

4,631,549

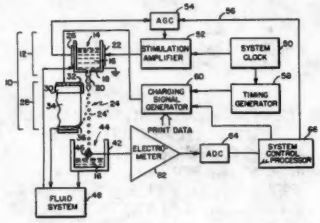
METHOD AND APPARATUS FOR ADJUSTING STIMULATION AMPLITUDE IN CONTINUOUS INK JET PRINTER

Hilarion Braun, Xenis; Linda Lush, and Scott Lehman, both of Dayton, all of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 15, 1985, Ser. No. 765,972
Int. Cl.⁴ G01D *18/00*
U.S. Cl. 346—1.1 **10 Claims**

1. A method for adjusting stimulation amplitude in a continuous ink jet printer to operate the ink jet printer in the satellite free region of ink drop production, characterized by the steps of:

periodically sensing the stimulation amplitude at which infinite satellites are first produced, and



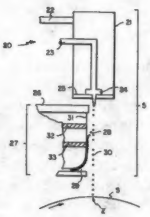
adjusting the stimulation amplitude as a function of the sensed amplitude.

4,631,550

DEVICE AND METHOD FOR SENSING THE IMPACT POSITION OF AN INK JET ON A SURFACE OF AN INK CATCHER, IN A CONTINUOUS INK JET PRINTER

Michael J. Piatt, Enon, and Mark E. Brown, West Carrollton, both of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 15, 1985, Ser. No. 765,973
Int. Cl.⁴ G01D *18/00*
U.S. Cl. 346—1.1 **23 Claims**



9. A method for sensing the impact position of an ink jet on the vertical face of an ink catcher extending generally parallel to the ink jet and forming part of the printing head of an ink jet printer, comprising the steps of:

(a) varying an electrical property at said catcher face as a function of the portion of that face which is wetted by the ink flowing downstream the impact position of the jet and,

(b) sensing said electrical property and deriving therefrom a signal representative of the jet impact position.

4,631,551

COLOR IMAGING APPARATUS USING ELECTRO-OPTIC MODULATORS

Albert B. Vergona, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 762,173, Aug. 5, 1985, abandoned. This application Oct. 7, 1985, Ser. No. 784,990
Int. Cl.⁴ G01D *9/42, 15/14;* H04N *1/21*
U.S. Cl. 346—108 **4 Claims**

1. Color imaging apparatus for forming a beam of light having three separate intensity modulated color components and for line scanning such beam across the surface of a photosensitive member for image recording, comprising:

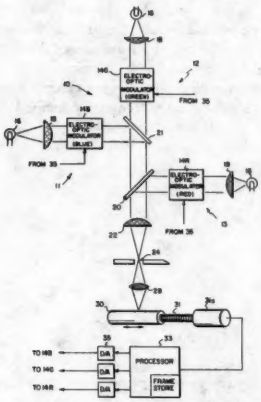
(a) three separate color component light modulating channels, each including:

(i) a panchromatic, incoherent light source;

(ii) means for collimating light from the source;

(iii) an electro-optic modulator responsive to a voltage signal for establishing an electric field which modulates the intensity of collimated light from the source passing through it in accordance with the desired intensity of a color component; and

(iv) feedback means for sensing the intensity of light at the output of the modulator to produce an error signal which is a function of the difference in intensity of the color component from a desired level, said feedback means including means responsive to said error signal for adjusting the voltage signal applied to the electro-optic modulator to effect a change in the electric field and cause the light intensity at such output to be at the desired intensity;



(b) means including two dichroic mirrors for separating light from each channel into an intensity modulated, color component;

(c) means for combining the color components into a single beam and for focusing such beam on the surface of the photosensitive member; and

(d) means for providing relative movement between the photosensitive member and the beam for line scanning the beam across the member's surface.

4,631,552

THERMAL RECORDER PAPER STACKER

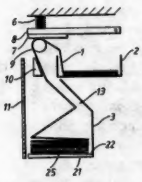
Shouzou Kobayashi, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 20, 1985, Ser. No. 703,495

Claims priority, application Japan, Feb. 28, 1984, 59-26698[U]

Int. Cl.⁴ G01D *15/24, 15/00;* **B41J** *11/26*

U.S. Cl. 346—136 **2 Claims**



1. A recorder comprising:

a supply of fanfold recording paper, said paper being divided by folds into lengths and having a width extending in a transverse direction to said lengths and parallel to said folds;

a tray for receiving said paper;

a thermal head for recording data on said paper;

a paper supporting surface in said tray,

an assisting member disposed substantially in the widthwise center of and on said paper supporting surface and extending over only a portion of the width of the received recording paper and having a length substantially equal to the length of said paper between folds, for assisting the folding of said recording paper by raising the central portion of the width of the stack of the folded fanfold recording paper to a prescribed height, and

guides located on the paper supporting surface of the tray and spaced at an interval substantially equal to the width of the recording paper for initially positioning the recording paper on the paper supporting surface,

wherein at least either the assisting member and the paper supporting surface are inclined for increasing the height of the stacked recording paper at a front side thereof in a direction normal to the width of the recording paper.

4,631,553

PRINTER HEAD OF AN INK-JET PRINTER

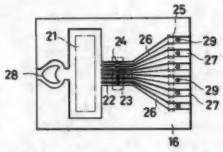
Takuro Sekiya, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

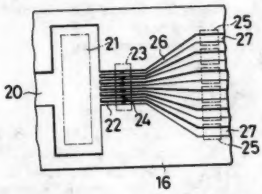
Continuation-in-part of Ser. No. 399,004, Jul. 16, 1982, abandoned. This application Apr. 8, 1985, Ser. No. 720,489

Claims priority, application Japan, Jul. 17, 1981, 56-111668; Aug. 20, 1981, 56-130786; Aug. 20, 1981, 56-130787

Int. Cl.⁴ G01D *15/16*

U.S. Cl. 346—140 R **18 Claims**





1. A printer head for use in a non-impact printer such as an ink-jet printer comprising:

a first flow passage extending from an ink inlet port to an ink draining port;

a second flow passage branching out from said first flow passage and connected to an ink discharging nozzle through which ink is discharged to form ink droplets to be deposited on a recording medium, said second flow passage having a first flow resistance against a flow of ink flowing therethrough which is substantially smaller than a second flow resistance presented by that portion of said first flow passage from the branch-out point between said first and second flow passages to said ink draining port;

means for periodically imparting motion to the ink residing between said ink inlet port and the branch-out point between said first and second flow passages thereby normally causing the ink to be discharged out of said ink discharging nozzle for use in printing; and

flow control means for controlling the flow of ink through

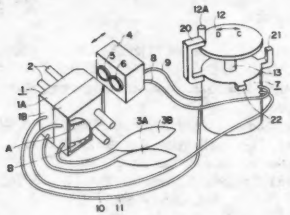
said ink draining port in response to an image signal supplied thereto whereby when said flow control means is operated to drain ink through said ink draining port, ink is prevented from being discharged out of said ink discharging nozzle through a difference between said first and second flow resistances.

4,631,554

INK JET PRINTING APPARATUS WITH SUCTION RECOVERY UNIT

Koji Terasawa, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1983, Ser. No. 536,736
Claims priority, application Japan, Oct. 4, 1982, 57-174201
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **4 Claims**



1. An ink jet printing apparatus comprising:

printing means for ejecting an ink as an ink drop from an opening onto a printing medium, the ink being stored inside said ink jet printing apparatus;

suction means, arranged to communicate with said printing means through a channel, for eliminating nonejection of the ink from said printing means by generating a negative pressure, said suction means having (i) a main body with a predetermined space therein, and (ii) a rotatable member, supported for rotational movement with respect to said main body, for generating the negative pressure in said space upon rotational movement thereof, said main body including means for detecting an angular position of said rotatable member; and

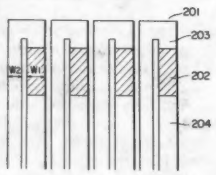
an operation member for enabling said rotatable member to be manually rotated.

4,631,555

LIQUID JET TYPE RECORDING HEAD

Masami Ikeda, Machida; Makoto Shibata, Hiratsuka; Hiroto Matsuda, Ebina, and Hiroto Takahashi, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1984, Ser. No. 596,908
Claims priority, application Japan, Apr. 19, 1983, 58-67723
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **1 Claim**



1. A liquid jet type recording head comprising a plurality of liquid discharge sections, each including an orifice for discharging liquid to form flying droplets and a liquid passage having therein a heat acting portion at which thermal energy acts on the liquid to provide the droplets, a plurality of electrodes, each being associated with one of each said liquid discharge sections and comprising opposed portions, and a plurality of electro-thermal converting elements, each having a heat generating portion located between said opposed portions of an associated one of said electrodes, wherein:

each of said electrodes has a turned portion with a part adjacent to and beside said associated heat generating portion and other parts adjacent to and beside said opposed portions of said electrode,

the part of said turned portion adjacent to said associated heat generating portion has a width smaller than the width of said heat generating portion and the width across said turned portion and said opposed portions of each said electrode is substantially the same as the width across said turned portion and said associated heat generating portion, and

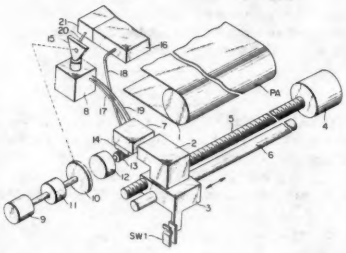
said heat generating portions are spaced from each other at locations providing a compactly formed recording head.

4,631,556

LIQUID JET RECORDING APPARATUS

Yoshitaka Watanabe, Tokyo, and Takashi Endo, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1984, Ser. No. 607,656
Claims priority, application Japan, May 11, 1983, 58-82351; May 11, 1983, 58-82352; May 11, 1983, 58-82354; May 16, 1983, 58-85206; May 16, 1983, 58-85207
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **24 Claims**



1. A liquid jet recording apparatus comprising:

a jet head for emitting a recording liquid;

a first recording liquid storing chamber of a large capacity;

a second recording liquid storing chamber of a small capacity said jet head communicating with said second chamber and said first chamber being isolated from said second chamber;

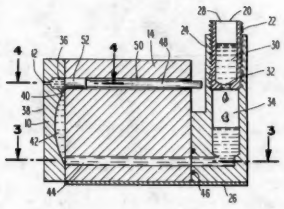
pressure producing means; and

supplying and didshcarging means, connected with said first chamber and selectively coupled to said second chamber and to said jet head, for supplying said recording liquid from said first recording liquid storing chamber to said second recording liquid storing chamber and discharging the recording liquid from said jet head in operation of said pressure producing means.

4,631,557
INK JET EMPLOYING PHASE CHANGE INK AND METHOD OF OPERATION

Theodore M. Cooke, Danbury, and William J. DeBonte, Kent, both of Conn., assignors to Exxon Printing Systems, Inc., Brookfield, Conn.

Filed Oct. 15, 1984, Ser. No. 660,656
The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R 61 Claims



1. A method of operating an ink jet comprising the following steps:

supporting ink in the solid state in a cartridge;

mounting the cartridge in communication with an ink jet;

melting the ink so as to change the ink from a solid state to a liquid state;

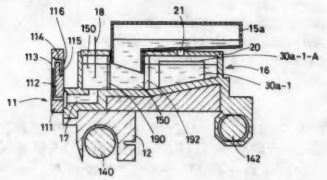
supplying the ink in the liquid state to the ink jet; and

ejecting droplets of ink from the ink jet.

4,631,558
INK LIQUID BAFFLE-REGULATED RESERVOIR IN AN INK JET SYSTEM PRINTER

Takafumi Hara, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 5, 1983, Ser. No. 491,667
Claims priority, application Japan, May 6, 1982, 57-76146
The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R 16 Claims



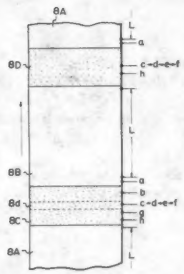
1. An ink liquid supply system for an ink jet system printer which includes a printer head mounted on a reciprocating carriage, said ink liquid supply system comprising: an ink liquid reservoir mounted on said reciprocating carriage, said ink liquid reservoir comprising:

a ceiling wall provided with an opening exposed to the atmosphere for introducing air into said ink liquid reservoir; at least one plate disposed in said ink liquid reservoir in a manner such that the plate stands in the ink liquid reservoir, the free top edge of the plate being separated from said ceiling wall of said ink liquid reservoir; and an ink liquid cartridge in liquid communication with said reservoir mounted on top of said reservoir wherein ink feeds from said cartridge into said reservoir when the ink level in said reservoir is lowered.

4,631,559
IMAGE FORMING METHOD

Shuzo Kaneko, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1984, Ser. No. 660,989
Claims priority, application Japan, Oct. 18, 1983, 58-195760
Int. Cl.[4] G01G *15/00*
U.S. Cl. 346—160 21 Claims



1. An image forming method of irradiating light onto a side of a photosensitive body having a photoconductive layer and a conductive layer, supplying a conductive developing agent to the photosensitive body while a bias voltage is applied between the conductive layer and the developing agent, and forming an image of the developing agent on the photosensitive body in accordance with the light irradiating the photosensitive body, comprising the sequentially performed steps of:

starting supplying said photosensitive body with the developing agent from the side opposing the light irradiated side of said photosensitive body and starting driving of said photosensitive body in a direction of image formation, which sub-steps are performed in any order;

starting application of the bias voltage between said photosensitive body and the developing agent;

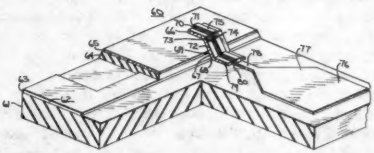
stopping application of the bias voltage after irradiation of the light is completed and stopping driving of said photosensitive body, which sub-steps are performed in any order; and

stopping supplying said photosensitive body with the developing agent.

4,631,560
MOMS TUNNEL EMISSION TRANSISTOR

Joseph A. Calviello, Kings Park, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 19, 1984, Ser. No. 683,686
Int. Cl.[4] H01L *49/02*
U.S. Cl. 357—6 18 Claims



1. An MOMS semiconductor device comprising:

a plurality of mesa stacked horizontal layers including at least one semiconductor layer having an exposed edge at a generally vertical side of the mesa;

a first metal layer having a generally vertical portion extending along said side of said mesa; and

a generally vertical oxide layer on said vertical portion of said first metal layer; and

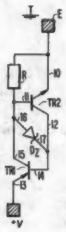
a second metal layer having a generally vertical portion on said oxide layer.

4,631,561

SEMICONDUCTOR OVERVOLTAGE SUPPRESSOR WITH ACCURATELY DETERMINED STRIKING POTENTIAL

Mario Foroni, Verona, and Franco Bertotti, Milan, both of Italy, assignors to SGS-ATES Componenti Elettronici SpA, Milano, Italy

Filed Jul. 23, 1984, Ser. No. 633,434
Claims priority, application Italy, Jul. 29, 1983, 22338 A/83
Int. Cl.⁴ H01L *29/90*
U.S. Cl. 357—13 **1 Claim**



1. A two-terminal semiconductor device with a three-junction structure which is formed on a semiconductor chip and which comprises:

a substrate of a first type of conductivity delimited by a first main surface of said semiconductor chip;

a layer of a second type of conductivity disposed on said substrate and delimited by a second main surface of said semiconductor chip;

a layer of insulating material which extends onto said second main surface;

a first region of said first type of conductivity that extends into said layers of said second type of conductivity from said second main surface;

a second region of said second type of conductivity which extends into said first region from said second main surface;

a first metallic layer which is in ohmic contact with said substrate on said first main surface thereof; and

a second metallic layer which extends onto a portion of said second main surface through an aperture in said insulating layer so as to be in ohmic contact with said first and second regions, and which is on said insulating layer so as to rise above a portion of said layer of said second type of conductivity along a contour of said first region;

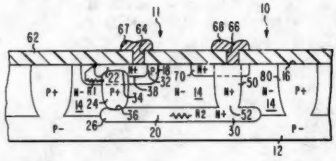
wherein said layer of said second type of conductivity has at least one zone which is adjacent to a boundary plane portion of a junction formed between said first region and said layer of said second type of conductivity, said zone having a concentration of impurities that is greater than that of the rest of said layer, and said zone being localized in a portion of said boundary with said first region which does not contact said second region.

4,631,562

ZENER DIODE STRUCTURE

Leslie R. Avery, Hunterdon County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 31, 1985, Ser. No. 739,820
Int. Cl.⁴ H01L *29/90*
U.S. Cl. 357—13 **7 Claims**



1. A temperature compensating buried zener diode device comprising:

(a) a substrate of a first conductivity type semiconductor material;

(b) a first layer of a second conductivity type semicondutor material disposed on said substrate and having a surface;

(c) a second layer of highly doped second conductivity type semiconductor material intermediate a portion of said substrate and said first layer;

(d) a first region of first conductivity type diposed within and in PN junction forming relation with said first layer and extending downwardly from said surface directly opposed but not in contact with one end of said second layer;

(e) a second region of highly doped second conductivity type extending downwardly from said surface entirely within said first region and being in PN junction forming relation with said first region at an interface therebetween and forming a first zener breakdown junction at said interface;

(f) a third region of highly doped first conductivity type in said first layer, said third region being in PN junction forming relation with said second region along a portion of said interface directly opposed said second layer thereby forming a second zener breakdown junction therebetween, said third region extending through both said first region and said first layer and into PN junction forming relation with said one end of said second layer thereby forming a third zener breakdown junction threebetween; and

(g) a fourth region of second conductivity type in said first layer extending downwardly from said surface into electrical contact with another end of said second layer.

4,631,563

METAL OXIDE SEMICONDUCTOR FIELD-EFFECT TRANSISTOR WITH METAL SOURCE REGION

Tetsuya Iizuka, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 211,929, Dec. 1, 1980, abandoned. This application Mar. 8, 1984, Ser. No. 585,639
Claims priority, application Japan, Dec. 7, 1979, 54-157967
Int. Cl.⁴ H01L *29/78*
U.S. Cl. 357—23.1 **3 Claims**

1. A metal oxide semiconductor field-effect transistor comprising:

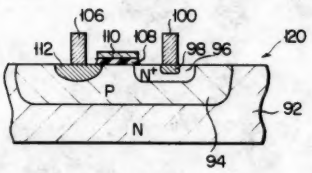
A semiconductor layer of a first conductivity type;

means for providing an inversion layer carrier source consisting essentially of a metal diffusion region, formed in said semiconductor layer in ohmic contact with said semiconductor layer;

a drain region of a second conductivity type formed in said semiconductor layer and separated from said metal diffusion region;

an insulating layer formed on said semiconductor layer between said metal diffusion region and drain region;

a gate layer formed on said insulating layer, whereby (i) current flows in a first direction between said metal diffusion region and said drain through an inversion layer which is induced in the surface of said semiconductor layer under said gate layer and which is coupled to said



metal diffusion region when a first polarity voltage is applied to said gate layer, and (ii) a current flows in a second, opposite direciton between said metal diffusion region and said semicondcutor layer and a p-n junction between said semiconductor layer and said drain region is reverse biased when a second polarity votlage is applied to said gate layer.

4,631,564

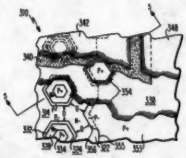
GATE SHIELD STRUCTURE FOR POWER MOS DEVICE

John M. S. Neilson, Lower Providence Township, Montgomery County; Carl F. Wheatley, Jr., Butler Township, Luzerne County, both of Pa., and Norbert W. Brackelmanns, Randolph Township, Morris County, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 23, 1984, Ser. No. 664,027

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.4 **7 Claims**



1. In a VDMOS device comprising a semiconductor wafer having first and second opposing major surfaces, a first conductivity type drain region at the first surface, an array of second conductivity type body regions diffused into the drain region from the first surface and spaced from each other by a distance D, each forming a body/drain PN junction, a relatively high conductivity supplementary body region diffused into each body region from within the boundary thereof at the first surface, a first conductivity type source region diffused into each body region so as to form a source/body PN junction, the spacing between the source/body PN junction and body/drain PN junction defining a channel region at the first surface, a source electrode contacting the source and body regions, an insulated gate electrode overlying the channel region, and a gate bond pad, in direct contact with the gate electrode, overlying a second conductivity type gate shield region and insulated therefrom, the gate shield region being contiguous with the drain region and spaced from the channel regions, the improvement comprising:

a predetermined number of source/body cells neighboring the gate shield region and being spaced therefrom by distance D;

the gate shield region including a plurality of contact areas proximate to the periphery thereof;

the gate bond pad including a bonding area portion and a runner;

the number of said contact areas which neighbor the bonding area portion being approximately equal to the number of source/body cells which neighbor the bonding area portion;

the number of said contact area which neighbor the runner being approximately equal to one fifth the number of course/body cells which neighbor the runner, the contact areas which neighbor the runner being substantially uniformly spaced from each other; and

the source electrode ohmically contacting said contact areas.

4,631,565

MISFET WITH INPUT AMPLIFIER

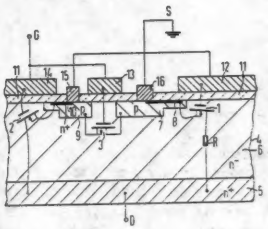
Jenö Tihanyi, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 2, 1983, Ser. No. 557,712

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1983, 3301648

Int. Cl.⁴ H01L *29/78, 27/02*

U.S. Cl. 357—23.4 **6 Claims**



1. A semiconductor device having a substrate, the substrate containing a first vertical MISFET of a first channel type including a first source zone and a gate zone controlled by a gate electrode, the drain zone of the first vertical MISFET is formed by the substrate, the first source zone and the gate zone extending from a first surface of said substrate into said substrate, an improvement comprising:

(a) a second vertical MISFET of said first channel type including a second source zone and a gate zone controlled by a gate electrode, the drain zone of the second vertical MISFET is formed by said substrate said second source zone and the gate zone of said second MISFET extending from said first surface into said substrate;

(b) a lateral MISFET of a second channel type with a source zone located on the first surface of said substrate and a drain zone located on the first surface, said source zones of said second vertical MISFET and of said lateral MISFET being electrically connected to each other and to the gate electrode of said first vertical MISFET, the gate electrodes of said lateral MISFET and of said second vertical MISFET being electrically connected to each other, and the drain zone of said lateral MISFET being electrically connected to the source zone of said first vertical MISFET;

(c) said gate zone of said first vertical MISFET and said drain zone of said lateral MISFET being a single zone and

said source zone of said lateral MISFET and said gate zone of said second vertical MISFET being a single zone;

(d) the first source zone embedded in said drain zone of said lateral MISFET and bounded by the first surface and the second source zone embedded in said source zone of said lateral MISFET and being of an opposite conductivity type thereto; and

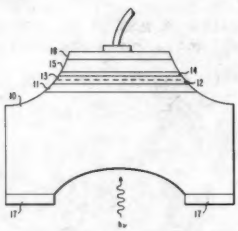
(e) a first contact electrically connected to the first source zone of said first vertical MISFET and being electrically connected to said drain zone of said lateral MISFET, and a second contact electrically connected to the second source zone of said second vertical MISFET and being electrically connected to the source zone of said lateral MISFET.

4,631,566

.LONG WAVELENGTH AVALANCHE PHOTODETECTOR

Joe C. Campbell, Middletown, and Andrew G. Dentai, Atlantic Highlands, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 22, 1983, Ser. No. 525,455
Int. Cl.[4] H01L *27/14, 31/00*
U.S. Cl. 357—30 **7 Claims**



1. In a semiconductor device including in succession a first conductivity type terminal region, a second conductivity type multiplication region, a second conductivity type grading region, and a second conductivity type absorption region, each region being comprised of semiconductor material, the device being characterized in that the multiplication region is comprised of a first multiplication layer and a second multiplication layer, both multiplication layers being substantially identical with respect semiconductor composition and substantially similar with respect to carrier concentration.

4,631,567

PNPN INTEGRATED CIRCUIT PROTECTIVE DEVICE WITH INTEGRAL RESISTOR

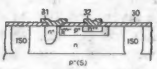
Masayuki Koksdo, Kawasaki, and Hidezi Sumi, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 543,215, Oct. 19, 1983, abandoned, which is a continuation of Ser. No. 221,330, Dec. 29, 1980, abandoned. This application Jan. 23, 1985, Ser. No. 693,306
Claims priority, application Japan, Dec. 27, 1979, 54-169181
Int. Cl.[4] H01L *29/74*
U.S. Cl. 357—38 **4 Claims**

1. A semiconductor device for receiving an input signal, comprising: a substrate, an internal circuit formed in the substrate and an electrostatic destruction preventing circuit formed in the substrate and connected between a predetermined electrical potential point which is operatively connected to receive a most negative power supply voltage, and having a signal input terminal which is operatively connected to receive the input signal for said internal circuit, wherein said electrostatic destruction preventing circuit comprises:

a PNP-transistor having a collector region, a base region, and an emitter region connected to said predetermined electrical potential point;

an NPN-transistor having an emitter region connected to said signal input terminal and to said internal circuit, a collector region connected to the base region of said



PNP-transistor, and a base region connected to the collector region of said PNP-transistor; and

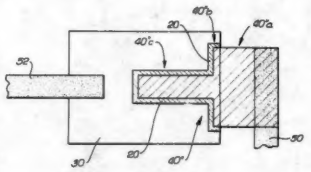
resistor means comprising a portion of the collector region of said PNP-transistor, and the base region of said NPN-transistor.

4,631,568

BIPOLAR TRANSISTOR CONSTRUCTION

Neal F. Gardner, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 473,382, Mar. 8, 1983. This application Apr. 16, 1984, Ser. No. 600,707
Int. Cl.[4] H01L *27/12*
U.S. Cl. 357—49 **4 Claims**



1. A bipolar transistor construction, comprising:

a collector region formed from a semiconductor material having a first conductivity type;

a base region formed over said collector region, from a semiconductor material having the opposite conductivity type to that of the collector region;

an emitter region formed to overlap a selected mid-portion of said base region, from a semiconductor material of the same conductivity type as said collector region;

a wall of insulating material formed on said base region in contact with the edges of said emitter region and having a height approximately equal to the thickness of said emitter region; and

a conductive layer formed over said base region and said emitter region but not over said wall of insulating material, said conductive layer serving to establish separate connections to said base region and said emitter region;

whereby said wall of insulating material electrically separates the separate connections to said base and emitter regions and reduces the size of inactive portions of said

base region, thereby decreasing base resistance and base-collector capacitance, and increasing speed and device packing density;

and wherein said emitter region has a relatively wide inactive portion, not overlapping said base region, and an adjoining active portion with a first area that is of substantially the same width as the inactive portion, to provide a relatively low emitter resistance, and a contiguous second area that is narrower than the first area and provides a relatively long active emitter perimeter and therefore a relatively low base resistance.

4,631,569

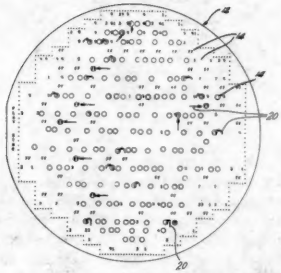
MEANS AND METHOD OF REDUCING THE NUMBER OF MASKS UTILIZED IN FABRICATING COMPLEX MULTI-LEVEL INTEGRATED CIRCUITS

Donald F. Calhoun, Inglewood, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Continuation of Ser. No. 211,037, Dec. 22, 1971, which is a continuation of Ser. No. 16,868, Mar. 5, 1970, abandoned. This application Dec. 13, 1974, Ser. No. 532,359

Int. Cl.[4] H01L *27/06*

U.S. Cl. 357—45 **11 Claims**



1. A multi-level complex integrated circuit for defining a specific electrical function fabricated in an identical manner on each of a plurality of N (where N is an integer) wafers each having an imperfect yield of cells including usable cells distributed randomly across the surfaces of the N wafers, said usable cells terminating in signal-connects at a first level of metalization with a portion Y (where Y is an integer) of the usable cells having a common yield distribution on all N wafers, the improvement for each of the N wafers comprising:

means for defining a first layer of dielectric insulation on each of the N wafers and for defining identically located vias formed through said dielectric insulation layer only to the Y common yield usable cells at the first level of metalization, and thereby for identically exposing only the signal-connects of said Y common yield usable cells on each of the N wafers;

means for defining identically located electrical conductors in a second level of metalization on said dielectric insulation means for identical routing of said identically located electrical conductors from said exposed first level signal-connects of each of the N wafers to second level signal-connects at identical positions on each of the N wafers;

means for defining a second layer of dielectric insulation on said electrical conductor means of each of the N wafers and for defining identically located vias formed through said second dielectric insulation layer thereby for identically exposing said second level signal-connects on each of the N wafers; and

means for defining identically located electrical interconnect routings in at least a further level of metalization on said second layer of dielectric insulation means and for interconnecting said exposed second level signal-connects identically on each of the N wafers, thereby for enabling performance of the specific electrical function.

4,631,570

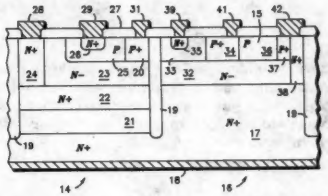
INTEGRATED CIRCUIT HAVING BURIED OXIDE ISOLATION AND LOW RESISTIVITY SUBSTRATE FOR POWER SUPPLY INTERCONNECTION

Mark S. Birrittella, Phoenix; Robert H. Reuss, Scottsdale, and Walter C. Seelbach, Fountain Hills, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 3, 1984, Ser. No. 628,019

Int. Cl.[4] H01L *27/12, 27/02*

U.S. Cl. 357—49 **1 Claim**



1. A monolithic semiconductor integrated circuit structure, comprising:

a plurality of islands, each of said islands comprising at least one semiconductor device;

a substrate of a first conductivity type for coupling to a voltage supply;

a first region comprising a dielectric material formed between said substrate and at least one of said plurality of islands of isolating said voltage supply from said at least one of said plurality of islands;

a second region having said first conductivity type and having a first portion epitaxially grown above said first region and a second portion epitaxially grown between said substrate and another of said plurality of islands;

a third region having a second conductivity type formed at a surface of said first portion of said second region;

a fourth region having said first conductivity type formed at a surface of said third region, said first portion of said second region, and said third and fourth regions forming a first semiconductor device;

a fifth region having said second conductivity type epitaxially grown on a surface of said second portion of said second region;

a sixth region having said first conductivity type epitaxially grown on a surface of said fifth region, said second portion of said second region, and said fifth and sixth regions forming a second semiconductor device;

a seventh region having said second conductivity type, formed at a surface of a third portion of said second region and adjacent to said fifth region; and

an eighth region having said first conductivity type formed at a surface of said substrate and extending adjacent to said second and seventh regions.

4,631,571

SEMICONDUCTOR DEVICE FOR USE IN A LARGE SCALE INTEGRATION CIRCUIT

Fusao Tsubokura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 14, 1984, Ser. No. 589,371

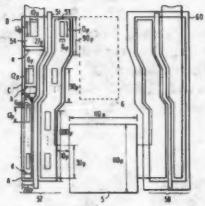
Claims priority, application Japan, Mar. 14, 1983, 58-41673

Int. Cl.[4] H01L *23/48, 29/44, 29/78, 27/10*

U.S. Cl. 357—68 **10 Claims**

1. A semiconductor device comprising an output buffer element having an MOS transistor and a bonding pad on a

semiconductor chip, said MOS transistor having a source region, a gate electrode and a drain region, said source region having a first end portion, an intermediate portion narrower than said first end portion and a second end portion narrower than said intermediate portion, said second end portion being



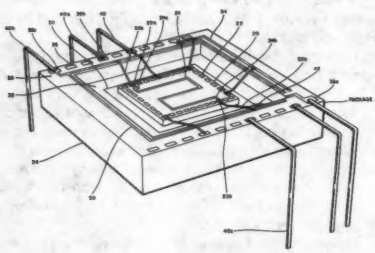
adjacent to said bonding pad and near a peripheral side of said semiconductor chip, said first end portion being positioned far from said peripheral side of said semiconductor chip, and said gate electrode and said drain region being elongated along and in parallel with said source region.

4,631,572

MULTIPLE PATH SIGNAL DISTRIBUTION TO LARGE SCALE INTEGRATION CHIPS

Thomas A. Zimmerman, Rancho Palos Verdes, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Sep. 27, 1983, Ser. No. 536,129
Int. Cl.[4] H01L *23/02, 23/16, 39/02*
U.S. Cl. 357—74 **4 Claims**



3. In combination:

an integrated circuit chip package substrate having an area at one side of the substrate on which an integrated circuit chip may be mounted;

an integrated circuit chip mounted on said substrate area and having a plurality of pads exposed at one side of the substrate;

a first ring conductor having an exposed surface at said one side of said substrate at least partially surrounding said chip and substrate area between the substrate area and the edge of said substrate;

a plurality of conductive bases at said one side of said substrate between said ring conductor and the edge of the substrate;

a plurality of external connection pins about the edge of said substrate;

at least one conductor such as a wire extending across said side of the substrate and directly bonded at one end of to said exposed ring conductor surface and at its other end to a selected chip pad;

additional connectors such as wires extending across said one side of the substrate and each bonded at one end to a substrate base and at is other end to a chip pad;

an integrated circuit bus conductor extending across the chip, said bus conductor having at least two ends connected to separate chip pads, respectively; and

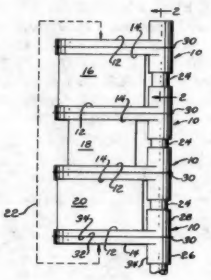
conductors such as wires extending across said one side of the substrate and bonded directly to said latter chip pads, respectively, and to said ring conductor.

4,631,573

COOLED STACK OF ELECTRICALLY ISOLATED SEMICONDUCTORS

Thomas A. Sutrina, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 24, 1985, Ser. No. 738,057
Int. Cl.[4] H04N *9/02;* H02B *1/00;* F28F *7/00;* H01B *7/34*
U.S. Cl. 357—82 **12 Claims**



1. A heat sink structure comprising:

a thin sheet of electrical insulating material;

first and second electrically conductive heat sink elements each having a planar surface and an opposite side configured to make good electrical and thermal contact with a semiconductor, each said heat sink element having a fluid inlet and a fluid outlet spaced from said inlet and an internal conduit interconnecting said inlet and said outlet and said conduit being in heat transfer relation to said opposite side, and elements sandwiching said sheet between said planar surfaces; and

means bonding said planar surfaces to said sheet.

4,631,574

COMPATIBLE HIGH-DEFINITION TELEVISION WITH EXTENDED ASPECT RATIO

Joseph L. LoCicero, Riverside; Melih Pazarci, Chicago, and Theodore S. Rzeszewski, Lombard, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 29, 1984, Ser. No. 626,453
Int. Cl.[4] H04N *11/06, 7/06*
U.S. Cl. 358—12 **23 Claims**

1. A system for encoding high-definition luminance and chrominance information from a high-definition video source having low-frequency chrominance and luminance information and high-frequency luminance and chrominance information and extended aspect ratio luminance and chrominance information, said system comprises

means for gating said low-frequency and high-frequency luminance and chrominance information from said high-definition luminance and chrominance information;

means for time expanding the gated low-frequency and high-frequency luminance and chrominance information;

means for encoding the time expanded low-frequency luminance and chrominance information into a first baseband signal;

means for encoding the expanded high-frequency luminance and chrominance information into a second baseband signal;

means for separating said extended aspect ratio luminance and chrominance information from said high-definition luminance and chrominance information;

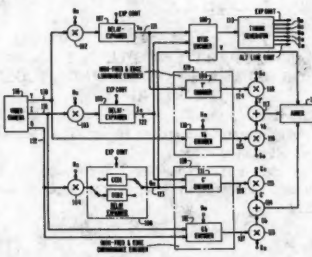
means for encoding the separated extended aspect ratio luminance and chrominance information into the horizontal retrace interval of said second baseband signal; and

means for transmitting said first baseband signal and said second baseband signal.

8. A system for decoding high-definition information of a high-definition baseband video signal having a first baseband signal including low-frequency luminance and chrominance information and a second baseband signal including high-frequency luminance and chrominance information and band-limited edge luminance and chrominance information in the horizontal retrace interval of said second baseband signal to provide extended aspect ratio information, said system comprises

means for decoding said low-frequency and high-frequency luminance information;

means for time compressing the decoded low-frequency and high-frequency luminance information;



means for decoding said band-limited edge luminance information;

means for combining the compressed low-frequency and high-frequency luminance information and the decoded band-limited edge luminance information for display;

means for decoding said low-frequency chrominance information;

means for decoding said high-frequency chrominance information;

means for combining the decoded low-frequency chrominance information and the decoded high-frequency chrominance information;

means for time compressing the combined low-frequency and high-frequency chrominance information;

means for decoding said band-limited edge chrominance information; and

means for adding the time compressed low-frequency chrominance information and high-frequency chrominance information and the decoded band-limited edge chrominance information for display.

4,631,575

CHARGE TRANSFER DEVICE FOR FORMING DESIRED COLOR DIFFERENCE SIGNALS

Maki Sato, Sagamihara, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP83/00149, § 371 Date Jan. 19, 1984, § 102(e) Date Jan. 19, 1984, PCT Pub. No. WO83/04361, PCT Pub. Date Dec. 8, 1983

PCT Filed May 19, 1983, Ser. No. 573,913

Claims priority, application Japan, May 21, 1982, 57-86254

Int. Cl.[4] H04N *9/67, 9/64, 9/04, 9/07*

U.S. Cl. 358—30 **8 Claims**

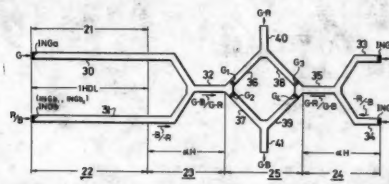
1. A charge transfer device for processing color signals, comprising:

signal separating means for forming a first color signal during predetermined periods and for forming a sequential signal formed of alternating second and third color signals such that only one of said second and third color signals is present during alternate ones of said predetermined periods;

first charge transfer means for forming first color signal charges connected to receive said first color signal from said signal separating means;

second charge transfer means for forming sequential signal charges connected to receive said sequential signal from said signal separating means;

first combining means for combining the first color signal



charges with the sequential signal charges during said predetermined periods so as to create sequential resultant signal charges formed of first and second resultant signal charges such that only one of said first and second resultant signal charges is present during alternate ones of said predetermined periods; and

switching means having a first input and two outputs, wherein said switching means receives the sequential resultant signal charges formed of the first and second resultant signal charges at the first input and outputs the first resultant signal charges at one output and the second resultant signal charges at the other output during said predetermined periods.

4,631,576

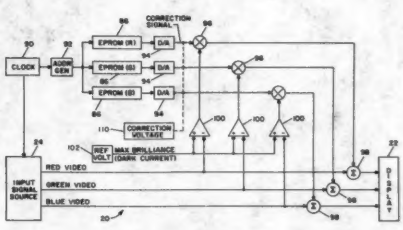
NONUNIFORMITY CORRECTION SYSTEM FOR COLOR CRT DISPLAY

Karl M. St. John, Huntington Station, N.Y., assignor to Hazeltine Corporation, Commack, N.Y.

Filed Nov. 13, 1984, Ser. No. 671,137

Int. Cl.[4] H04N *9/20, 9/16, 5/243, 5/68*

U.S. Cl. 358—65 **9 Claims**



1. A CRT display compensation system for correction of nonuniformity comprising:

a. means for storing correction signals as a function of primary color and as a function of location on a screen of said display;

b. means for combining the correction signals with video display signals employed in driving electron guns of said display; and

c. means coupled between said storing means and said combining means for altering the values of said correction signals in inverse proportion to the magnitudes of the video display signals.

4,631,577

IMAGE FORMING APPARATUS DISPLAYING THE STEPS OF THE IMAGE FORMING PROCESS

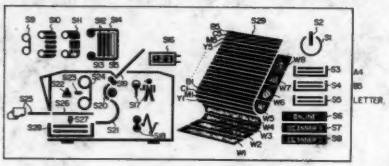
Eiichi Yamanishi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 27, 1984, Ser. No. 635,161

Claims priority, application Japan, Aug. 1, 1983, 58-140870; May 1, 1984, 59-088045

Int. Cl.[4] H04N *1/46, 1/00;* G01D *15/10;* G03G *15/01*

U.S. Cl. 358—75 **8 Claims**



1. An image forming apparatus comprising:

means for forming a color image on an image forming medium by sequentially forming color component images superimposedly on each other; and

displaying means for representing the image forming medium, a displaying area of said displaying means being gradually increased in accordance with the progress of image formation by said forming means in order to indicate steps of an image forming process.

4,631,578

METHOD OF AND APPARATUS FOR FORMING A COLOR PICTURE USING A PLURALITY OF COLOR CORRECTION PROCESSINGS

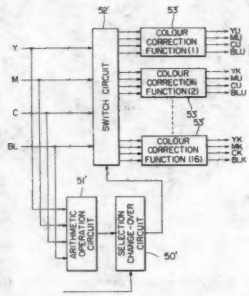
Takashi Sasaki; Hideaki Kawamura, both of Tokyo, and Nobuaki Sakurada, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1984, Ser. No. 583,735

Claims priority, application Japan, Mar. 4, 1983, 58-35359; Mar. 7, 1983, 58-37045

Int. Cl.[4] G03F *3/08;* H04N *1/46*

U.S. Cl. 358—80 **17 Claims**



1. Color picture forming method comprising the steps of:

inputting color input picture data;

forming a color picture using a plurality of colorants by selecting one of a plurality of combinations of colorants in response to the color input picture data;

providing a plurality of color correction processings corresponding to the plurality of combinations of colorants; and

selecting the color correction processing corresponding to the selected combination of colorants.

5. Color picture data processing method comprising the steps of:

inputting color input picture data;

dividing a color space into a plurality of areas;

providing a corresponding color correction processing for each of said areas; and

selecting at least two of said color correction processings for the color input picture data in a mutually exclusive random of alternating manner.

17. Color picture forming method of reproducing a color picture, comprising the steps of:

inputting color input picture data;

providing colorants for a pluraltiy of different colors, wherein a plurality of colorants of different concentrations are provided for at least one of the different colors;

providing a plurality of different color correction processings corresponding to a pluraltiy of different combinations of said colorants; and

selecting one of said pluraltiy of different combinations of said colorants and a corresponding one of said plurality of different color correction processings in response to the color input picture data.

4,631,579

METHOD AND APPARATUS FOR THE PRODUCTION OF COLOR SEPARATIONS FOR SINGLE COLOR PRINTING

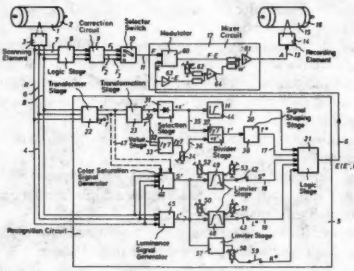
Ingo Hoffrichter, Kiel, and Eggert Jüng, Schoenberg, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Dec. 12, 1984, Ser. No. 680,820

Claims priority, application European Pat. Off., Dec. 14, 1983, 83112578.6

Int. Cl.[4] G03F *3/08;* H04N *1/46*

U.S. Cl. 358—80 **31 Claims**



1. A method for production of color separations of a color original for single color printing, comprising the steps of:

(a) trichromatically scanning the color original point-by-point and line-by-line by an optoelectronic scanning element for obtaining measured color value signals R, G, B;

(b) generating corrected color signals F_1, F_2, F_3 from the measured color value signals R, G, B;

(c) determining a color locus F_0 of a selected separation hue T_0 of a color of the original by color values R_0, G_0, B_0;

(d) transforming the color locus F_0 of the selected separation hue T_0 into a chrominance plane of a chrominance/luminance color space by a first transformation of said color values R_0, G_0, B_0 corresponding chrominance values x'_0, y'_0 such that a transformed color locus F'_0 lies on one of the axes of a rotated X'Y' color coordinate system in said chrominance plane of the color space, and retaining transformation coefficients required therefor;

(e) continuously transforming color loci of hues of the scanned colors of the original into the chrominance plane by a second transformation of the measured color value

signals R, G, B into chrominance values x', y' with the previously identified transformation coefficients;

(f) selecting those chrominance values x', y' whose corresponding transformed color loci F' lie in a same half of the X'Y' rotated color coordinate system as the transformed color locus F'_0 of the selected separation hue T_0;

(g) acquiring a hue signal T' by forming a quotient of absolute values of the selected chrominance values x', y', this respectively corresponding to a tangent of an angle β described by the corresponding axis and a connecting line between coordinate origin and a transformed color locus F' of the hue of a scanned color of the original, the hue signal T' being a measure for a respective value-wise hue deviation of the hue of the scanned color of the original from the selected separation hue T_0;

(h) acquiring a hue recognition signal E' from auxiliary control signal H and the hue signal T', said hue recognition signal E' having its highest value when scanning the selected separation hue T_0 and having a value of zero when scanning a hue having a prescribed maximum hue deviation from the selected separation hue T_0, a sector-shaped hue recognition region being defined around the corresponding axis and around the selected separation hue T_0;

(i) emitting the hue recognition signal E' when the measured color value signals R, G, B fall within the hue recognition region;

(j) selecting at least one of said corrected color signals F_1, F_2, F_3 as a selected color signal F;

(k) combining said hue recognition signal E' for the selected separation hue T_0 with said selected color signal F to form a separation signal A; and

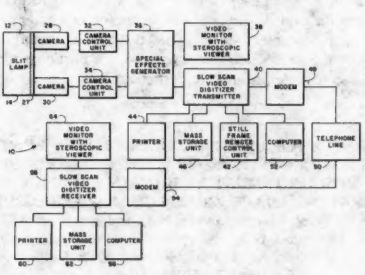
(l) recording a color separation point-by-point and line-by-line on a recording medium by a recording element controlled by said separation signal A.

4,631,580

VIDEO-STEREOSCOPIC-IMAGE-PRODUCING SYSTEM

John Taube, 3020 NW. 29th, Gainesville, Fla. 32605; Lawrence W. O'Dell, 34498 Deerwood Dr., Eugene, Oreg. 97401, and Michael D. O'Dell, 19030 SW. Willow Creek Ter., Aloha, Oreg. 97006

Filed Nov. 9, 1984, Ser. No. 670,321
Int. Cl.[4] H04N *7/18, 13/00*; A61B *3/14*
U.S. Cl. 358—88 **2 Claims**



1. A binocular camera mount for aligning two video cameras to produce a pair of image signals of an object for stereoscopic viewing by a remote observer comprising:

visual observing means for directly, ocularly stereoscopically viewing two input images of the object,

beam splitting means for diverting each input image into two image paths, one of which is directed to a video camera and the other of which is directed to said visual observing means,

adjusting means for adjusting the direction of projection of said one image path, and

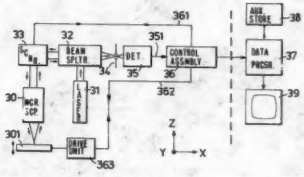
video-stereoscopic-image-producing system means for compiling the image signals into a combined video stereoscopic signal, transmitting the combined signal to a remote location, and generating a stereoscopic video display representative of the object for stereoscopic viewing by such an observer.

4,631,581

METHOD AND APPARATUS FOR MICROPHOTOMETERING MICROSCOPE SPECIMENS

Kjell S. Carlsson, Vallentuna, Sweden, assignor to Sarastro AB, Stockholm, Sweden

Filed Feb. 21, 1985, Ser. No. 703,842
Claims priority, application Sweden, Mar. 15, 1984, 8401458
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—93 **9 Claims**



1. A method for microphotometering and subsequent image combination by generating with the aid of a convergent light beam a luminous dot or cursor in the focal plane (11) of a microscope (30), fitting the cursor to a plurality of part elements in the specimen (10), and collecting light created by the luminous cursor and the specimen (10), detecting the collected light and producing corresponding electric signals, characterized by changing the mutual position between the specimen (10) and the focal plane (11) and re-fitting the luminous cursor to a plurality of part elements in the specimen (10); repeating stepwise changes in the mutual position between the specimen (10) and the focal plane (11) and, subsequent to each such change, again fitting or matching the luminous cursor to a plurality of part elements in the specimen; collecting the light created by the luminous cursor and part elements in the specimen (10) and screening-off any disturbing light created synchronously from adjacent (above, beneath, beside) part elements in the specimen (10); detecting the thus collected light and storing measurement values obtained through said detection, said storage optionally being effected synchronously with the matching of the luminous cursor with part elements in the specimen (10) and with the changes in the mutual position between the specimen (10) and the focal plane (11), said measurement values being representative of locations in various layers through the specimen; and combining the measurement values from locations in a plurality of layers, representative of a given volume of the specimen, in dependence upon a planned/desired analysis of the specimen.

4,631,582

ENDOSCOPE USING SOLID STATE IMAGE PICK-UP DEVICE

Tatsuo Nagasaki, Musashino, and Hiroyoshi Fujimori, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1985, Ser. No. 766,311
Claims priority, application Japan, Aug. 31, 1984, 59-183089
Int. Cl.[4] A61B *1/04, 1/06*
U.S. Cl. 358—98 **7 Claims**

1. An endoscope with a solid state image pick-up for receiving an image from a subject to be examined, comprising:

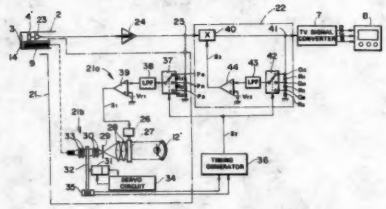
an illuminating means for projecting light onto the subject;

a first level detecting means for detecting a level of a video signal supplied from the solid state image pick-up device;

a first level comparing means connected to said first level detecting means for comparing the level of the signal detected by said first level detecting means with a preset first reference level and generating a first control signal in accordance with the level difference;

a light controlling means connected to the output of said first level comparing means for controlling the amount of light emitted from said illuminating means based on said first control signal;

a gain-variable amplifying means for receiving and amplifying the video signal from the solid state image pick-up device;



a second level detecting means connected to said gain-variable amplifying means for detecting the level of the signal therefrom; and

a circuit means connected to said second level detecting means for comparing the level of the signal detected by said second level detecting means with a preset second reference level and generating a second control signal in accordance with the level difference therebetween and providing said second control signal as a gain controlling signal to said gain-variable amplifying means.

4,631,583

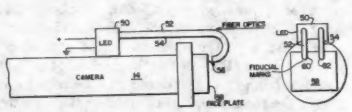
VIDICON IMAGE MOTION COMPENSATION TECHNIQUE

Mark O. Paul, Costa Mesa, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Jan. 28, 1985, Ser. No. 695,659

Int. Cl.[4] H04N 7/18

U.S. Cl. 358—125 **11 Claims**



1. In a video system having a camera for imaging a scene, the improvement comprising:

means connected to an output of the camera for tracking displacement of a moving image in the scene;

computing means connected to the tracking means for storing positional data of the moving image;

means for generating a reticle superimposed on a central point of the image;

interfacing means for combining video signals from the computing means and the generating means in order to form a combined signal, on a display, of the image and the reticle superimposed thereon; and

at least one fiducial mark applied to the faceplate of the camera, the computing means further ensuring a fixed preselected relationship between the displayed reticle and the fiducial mark which in turn ensures proper positioning of the displayed reticle over the image.

4,631,584

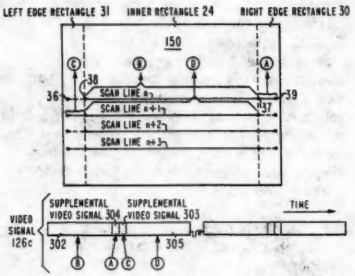
TRANSMISSION OF REDUCED RESOLUTION PICTURE EDGE INFORMATION USING HORIZONTAL BLANKING PERIOD

Glenn A. Reitmeier, Trenton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 3, 1984, Ser. No. 576,916

Int. Cl.[4] H04N 7/093

U.S. Cl. 358—141 **3 Claims**



3. An encoder, comprising:

a source for providing a video input signal representative of a wide screen image having an aspect ratio greater than 4:3, each line of said video input signal comprising a central portion and two end portions, said central portion corresponding to a portion of said image having a 4:3 aspect ratio;

a single transmission channel; and

circuit means for sequentially coupling said central portion and one of said end portions of said video input signal to said transmission channel during alternate line intervals and for sequentially coupling said central portion and the other of said end portions of said video input signal to said transmission channel during intermediate line intervals to provide a processed output signal for said transmission channel in which each line includes said central portion and only one of said end portions with said end portions alternating line by line and in which each said end portions of said processed video signal is timed to occur in an interval corresponding to a portion of a blanking interval of a given television broadcast standard.

4,631,585

APPARATUS FOR SYNCHRONIZING THE OPERATION OF A MICROPROCESSOR WITH A TELEVISION SYNCHRONIZATION SIGNAL USEFUL IN GENERATING AN ON-SCREEN CHARACTER DISPLAY

Charles M. Wine, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 7, 1984, Ser. No. 607,595

Int. Cl.[4] H04N 5/04

U.S. Cl. 358—148 **23 Claims**

1. Apparatus comprising:

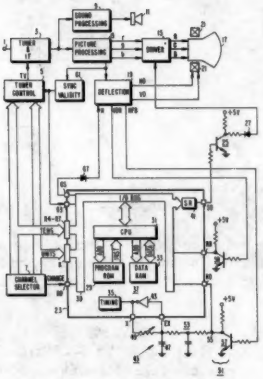
computing means operating in response to stored program instructions generated in timed relationship to instruction cycles occurring at a rate synchronously related to a clock signal;

clock signal generating means for generating said clock signal and for controlling the phase and frequency of said clock signal in response to a control signal;

a source of a reference frequency signal having a reference frequency;

said computing means being programmed to generate a

comparison signal each time a predetermined number of instruction cycles have occurred; and



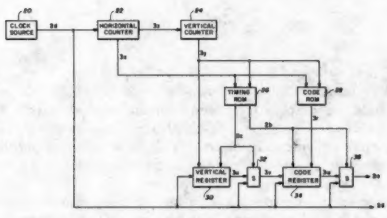
comparison means for comparing the phase and frequency of said comparison signal and said reference signal and generating said control signal in response thereto.

4,631,586

DIGITAL RASTER TIMING ENCODER/DECODER

Edward W. Gennetten, San Diego, and Duane A. Gomez, El Cajon, both of Calif., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 4, 1984, Ser. No. 617,220
Int. Cl.[4] H04N 5/04, 7/04
U.S. Cl. 358—148 **16 Claims**



1. A digital raster timing encoder/decoder system, for generating horizontal and vertical control synchronization signals for a video raster scan and other preselected timing and digital data signals for said video scan, comprising:

a clock source;

an encoding means connected to receive a clock signal from the clock source, said encoding means being preprogrammed to encode preselected digital signals to be output by said encoding means; and

a decoding means disposed to receive the encoded digital signals which are output by said encoding means, said decoding means programmed to decode the digital signals; wherein

the encoding means further comprises:

first means for counting connected to receive the clock source signal, said counting means disposed to accumulate count related to the time progression for horizontal video scan segments;

second means for counting connected to the output of the first counting means, said second counting means disposed to accumulate count in reference to the vertical control synchronization signals of the video raster scan;

first memory means connected to receive digital count signals from the first and second counting means;

second memory means connected to receive said digital count signals from the first and second counting means;

first means for registering, connected to receive said digital count signal from the second means for counting, a first digital timing signal from the first memory means, and also connected to receive the clock source signal, said first registering means storing said digital count signal for output; and

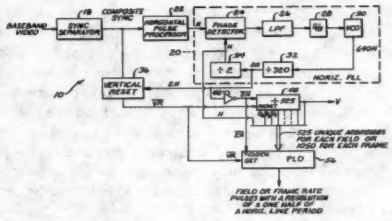
second means for registering connected to receive the stored digital count signal output from the first registering means, a second digital timing signal from the first memory means, said signal from the clock source, and a digital code signal from the second memory means, said second registering means encoding said code signal ahead of the digital count signal output from the first registering means, said second registering means outputting said encoded digital signals to said decoding means.

4,631,587

FIELD RESPONSIVE VERTICAL PULSE GENERATOR

Rudolf Turner, Vernon Hills, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Feb. 19, 1985, Ser. No. 702,534
Int. Cl.[4] H04N 7/04
U.S. Cl. 358—148 **8 Claims**



1. Apparatus for processing a baseband video signal having alternately occurring even and odd fields and including a composite sync signal having an H signal component for generating a pulse to within a half horizontal line resolution within the even and odd fields, said apparatus comprising:

first means responsive to the composite sync signal for developing the H signal and a 2H signal;

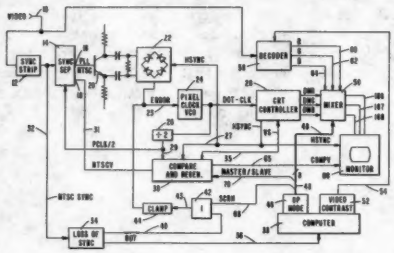
counting means coupled to said first means and responsive to said 2H signal for successively developing a sequence of coded signals, wherein each of said coded signals identifies a respective half of a horizontal line within successive alternating even and odd fields of the baseband video signal; and

decoding means coupled to said first means and to said counting means and responsive to said developed H signal and to said sequence of coded signals respectively output therefrom for developing a first selected decoded signal during each said even field of the baseband video signal and a second selected decoded signal during each said odd field of the baseband video signal.

4,631,588
APPARATUS AND ITS METHOD FOR THE SIMULTANEOUS PRESENTATION OF COMPUTER GENERATED GRAPHICS AND TELEVISION VIDEO SIGNALS

Lawrence C. Barnes, Apopka, and Robert G. Mankedick, Longwood, both of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 11, 1985, Ser. No. 700,568
Int. Cl.[4] H04N 5/04
U.S. Cl. 358—149 19 Claims



10. In a system for overlaying a computer display on a video signal, an apparatus for generating vertical sync pulses comprising:

video input means for receiving a video signal including sync pulses;

separating means for separating horizontal sync pulses and vertical pulses from the sync pulses of the video signal received by said video input means;

computer graphics sync pulse generating means for generating computer graphics sync pulses in phase with the horizontal sync pulses of said separating means when a video signal is received by said video input means, and for generating computer graphics sync pulses at a set rate when a video signal is not received by said video input means; and

counter means for generating vertical sync pulses responsive to vertical sync pulses separated by said separating means when a video signal is received by said video input means, and for generating vertical sync pulses responsive to a set number of generated computer graphics sync pulses counted from the last vertical sync pulse from said separating means when a video signal is not received by said video input means.

4,631,589
DARK LEVEL RESTORING CIRCUIT

Masayuki Hongu, Kanagawa; Takahiko Tamura, Tokyo, and Masaharu Tokuhara, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

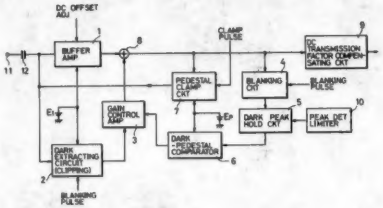
Filed Aug. 20, 1984, Ser. No. 642,334
Claims priority, application Japan, Aug. 22, 1983, 58-152926
Int. Cl.[4] H04N 5/16
U.S. Cl. 358—171 7 Claims

1. A dark level restoring circuit for use in a television apparatus, comprising:

extracting means for extracting a dark signal from an incoming video signal exceeding a predetermined dark level;

adding means connected to said extracting means for adding the extracted dark signal to said incoming video signal;

peak detecting means connected to said adding means for detecting a dark peak of a video signal obtained from said adding means; and

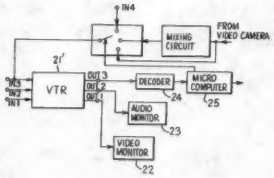


adjusting means connected to said adding means and said peak detecting means for adjusting a level of the extracted dark signal to be added to said incoming signal.

4,631,590
AUTOMATIC CAMERA CONTROL SYSTEM

Kimichika Yamada, and Takao Miyazaki, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 515,848, Jul. 21, 1983, abandoned. This application Feb. 4, 1986, Ser. No. 827,206
Claims priority, application Japan, Jul. 27, 1982, 57-130845; Jul. 27, 1982, 57-130846; Aug. 3, 1982, 57-118609; Aug. 4, 1982, 57-119199
Int. Cl.[4] H04N 5/24
U.S. Cl. 358—185 4 Claims



1. A self-control television system comprising:

an audio tape recorder having an audio tape which has prerecorded thereon self-control signals necessary for control of video signal recording of a series of pictures changing in a predetermined stepwise manner;

a video tape recorder;

an auto-focusing video camera having a color temperature switching member and a white balance adjusting member;

a video camera position control means for moving said video camera vertically and horizontally;

a video camera control means for controlling the color temperature switching member and white balance adjusting member of said video camera;

an illumination control means including a plurality of lamps with different colors associated with said camera for selectively turning on and off and adjusting brightness of said lamps;

a microcomputer having output means for outputting control signals to said video camera position control means, video camera control means and illumination control means for controlling same;

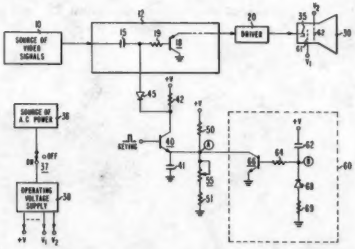
a decoder means for converting said self-control signals reproduced by said audio tape recorder into a digital signal and entering it in said microcomputer, said microcomputer being responsive to said digital signal to output said control signals to said individual ones of said control means; and

a video signal entering means for entering video signals from said video camera in said video recorder and therewith for recording said series of pictures.

4,631,591
KINESCOPE WITH COMPENSATED CONDUCTION CHARACTERISTIC

Wayne Lee, Taipei, Taiwan, assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 8, 1985, Ser. No. 699,556
Int. Cl.[4] H04N 5/63
U.S. Cl. 358—190 8 Claims

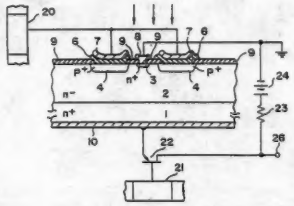


1. A video signal processing and display system comprising:
means for energizing said system;
a source of video signals containing information to be displayed;
an image display device coupled to said energizing means and responsive to said video signals, said display device having an inherent initial conduction characteristic resulting in declining light output during an initial warm-up interval from a time soon after the system is initially energized to a later time when stable steady-state operation is achieved;
a compensation circuit coupled to said energizing means and having a conduction characteristic which approximates the conduction characteristic of said display device during said warm-up interval; and
means for coupling said compensation circuit to said display device to counteract said initial conduction characteristic of said display device so that said display device exhibits substantially uniform conduction and light output during said warm-up interval.

4,631,592
SEMICONDUCTOR IMAGE SENSOR

Jun-ichi Nishizawa, Sendai, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Continuation of Ser. No. 527,574, Aug. 16, 1983, Pat. No. 4,562,474. This application Oct. 31, 1985, Ser. No. 793,239
Claims priority, application Japan, Dec. 17, 1981, 56-204656
Int. Cl.[4] H01L 27/14
U.S. Cl. 358—213 12 Claims

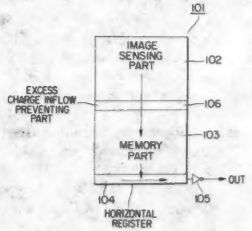


1. A semiconductor image sensor comprising:
a matrix corresponding to intersections of a plurality of row lines and a plurality of column lines on a substrate;
a static induction transistor photocell provided with said substrate for each said intersection, each said photocell including
a first main electrode connected to one of the column lines,
a second main electrode connected in common to the second main electrodes of the other photocells,
a channel region disposed in said substrate between the first and second main electrodes,
a control region in said substrate, and
a capacitor connected between said control region and a respective one of said row lines;
a respective switching transistor for each said column line, each including
a control electrode,
a first main electrode connected to the respective column line, and
a second main electrode connected in common to the second main electrodes of the other switching transistors;
a respective video line selecting circuit for each said column line, each connected to the control electrode of the respective switching transistor; and
a respective read address circuit for each said row line, connected to the gate electrode of each respective photocell via the respective capacitor
wherein said substrate includes a lightly doped layer of a first conductivity type in which each said channel region is formed, and each said transistor photocell has as its source or drain a first region of said first conductivity type but of higher conductivity than said lightly doped layer, each said first region being connected to a respective one of said first and second main electrodes of the respective photocell transistor and each said control region is formed of a second conductivity type that is opposite said first conductivity type.

4,631,593
STILL PICTURE RECORDING APPARATUS AND A SOLID-STATE IMAGE PICKUP DEVICE SUITABLE FOR THIS APPARATUS

Takao Kinoshita, Tokyo, and Shinji Sakai, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 557,937, Dec. 5, 1983, abandoned. This application Mar. 17, 1986, Ser. No. 841,025
Claims priority, application Japan, Dec. 14, 1982, 57-218882; Dec. 14, 1982, 57-218883
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213 23 Claims



1. A still picture recording apparatus comprising:
(A) solid-state frame transfer type charge-coupled image pick-up means having:
(A-1) an image pick-up portion for generating an image representing signal pattern in response to a received picture image;
(A-2) a storage portion for temporarily storing said signal pattern generated by said pick-up portion;
(A-3) a read-out portion for reading out the stored signal

pattern from said storage portion to produce an electrical output corresponding to the signal pattern; and

(A-4) an overflow signal clear portion for clearing said image pick-up portion of overflow signals, said overflow signal clear portion being disposed along a first side of said image pick-up portion opposite to a second side thereof to which said storage portion is coupled;

(B) recording means for recording a video signal representing said picture image on the basis of the electrical output of said image pick-up means; and

(C) control means for controlling said recording means and said image pick-up means, said control means enabling the recording means to record a video signal corresponding to a selected still picture image and causing said image pick-up means to prevent overflow signals from flowing into said storage portion from said image pick-up portion at least during the recording of the video signal by the recording means.

4,631,594

PROJECTION DEVICE

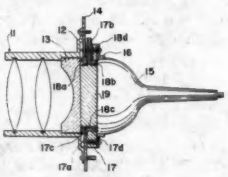
Koji Imahayashi; Hiroshi Kawamura, both of Toyonaka; Shigeru Takeuchi, Moriyama; Masayoshi Shinobu, Kyoto, and Shinobu Kawajiri, Nagaokakyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1985, Ser. No. 743,678

Claims priority, application Japan, Jun. 12, 1984, 59-122499

Int. Cl.[4] H04N *5/74*

U.S. Cl. 358—231 **7 Claims**



1. A projection device which comprises:

a CRT having a glass face surface and a fitting ear section;

a fitting bracket attached to said fitting ear section with a space therebetween;

a spacer having a ring-shaped body located in said space and having an internal groove in said body;

ring-shaped packing means, including an elastic thin film section contacting the internal surface of said spacer and covering said groove for providing a space in said groove of said spacer;

a lens unit having a cylindrical body and a fitting flange at one end thereof fixed to said fitting bracket;

a lens fixed within said cylindrical body adjacent said fitting flange and spaced from and confronting said CRT glass face surface,

said ring-shaped packing means extending from said lens to said CRT glass face surface; and

a transparent means having a light refractive index close to that of said CRT glass face for filling the space between said glass face surface of said CRT and said lens of said lens unit.

4,631,595

FEEDBACK DISPLAY DRIVER STAGE

John B. George, Carmel, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 25, 1985, Ser. No. 758,954

Int. Cl.[4] H04N *5/68, 9/16*

U.S. Cl. 358—243 **7 Claims**

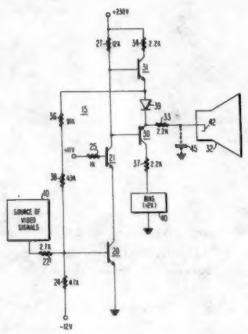
1. In a video signal processing system including an image display device for displaying video information in response to a video signal applied thereto, a display driver stage comprising:

an amplifier with an input for receiving video signals, and an output;

a first semiconductor device with an input coupled to said amplifier output, and an output for providing video signals to said display device;

a second semiconductor device with an input coupled to said amplifier output, and an output;

a feedback path coupled from said output of said second semiconductor device to said amplifier input; and



a normally nonconductive third semiconductor device coupled between said outputs of said first and second semiconductor devices and poled to conduct current from said output of said second semiconductor device; said third device being rendered conductive for coupling said amplifier output to said display device via said second semiconductor device in response to said first semiconductor device being rendered nonconductive in the presence of large video signal transitions of a given polarity.

4,631,596

IMAGE COMMUNICATIONS APPARATUS FOR LONG-SIZE COPY IMAGE

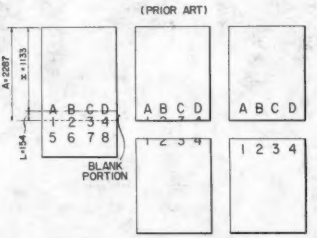
Tatsuya Yaguchi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 20, 1985, Ser. No. 703,673

Claims priority, application Japan, Feb. 24, 1984, 59-32602

Int. Cl.[4] H04N *1/18, 1/387*

U.S. Cl. 358—256 **11 Claims**



1. An image communications apparatus comprising:

first sensing means for sensing whether or not the length of an original image is longer than a predetermined length;

second sensing means for sensing a blank portion of the original; and

processing means for dividing the original image utilizing said blank portion as a border when the length of the

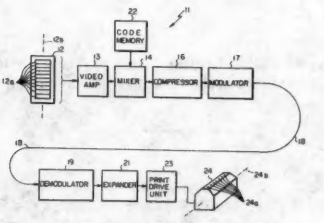
original image is sensed to be longer than the predetermined length.

4,631,597

VIDEO DATA TRANSMISSION APPARATUS

Mutsuo Ogawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 969,423, Dec. 14, 1978, abandoned. This application Mar. 8, 1982, Ser. No. 355,642
Claims priority, application Japan, Dec. 22, 1977, 52-153581
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—258 **21 Claims**



1. A video data transmission apparatus including scanning means for producing electrical data signals representing a visual image and transmission means for transmitting the data signals, characterized by comprising:

memory means for storing character code signals; and

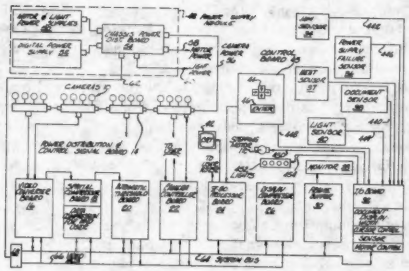
mixing means for reading the code signals out of the memory means, generating character dot signals corresponding to the character codes in a same line scan format as the data signals and mixing the character dot signals with the data signals for transmission by the transmission means as a single integral image.

4,631,598

HIGH SPEED, HIGH RESOLUTION IMAGE PROCESSING SYSTEM

Norman S. Burkhardt, 6868 Wyman Way, Westminster, Colo. 80030; Maureen M. Richard, 2020 S. Fairplay St., Aurora, Colo. 80014; Forrest T. Buxton, 7216 S. Zephyr Way, Littleton, Colo. 80123, and Ronald J. Nowak, 1037 S. Evanston Way, Apartment 101, Aurora, Colo. 80012

Filed Oct. 15, 1984, Ser. No. 660,854
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—280 **8 Claims**



1. A high speed, high resolution document scanning system comprising:

CCD detector means aligned in a linear array for sequentially scanning documentary data and producing an analog signal representative of scanned documentary data;

video converter means for digitizing said analog signal and calibrating said digital signal for response levels of individual detector elements of said CCD detector means;

spatial compressor means for electronically compressing data by both integer and fractional values to match the data handling capabilities of an end user device;

automatic thresholding means for setting gain and offset levels and for performing pixel averaging and prediction techniques to detect edges and filter out noise variances;

camera controller means for controlling the sequential reading of data from said CCD detector means to said video converter means, merging overlapping data from said CCD detector means to provide raster lines of non-overlapping and continuous data, selecting a contiguous subset of detector arrays of said CCD detector array means which fall within the scan width of said documentary data and selecting a predetermined dead time between said raster lines of data to variably control the scanning speed of said scanning system to control the average data output rate;

display means for electronically displaying said scanned documentary data in real time with a preselected variable resolution allowing varying amounts of said scanned documentary data to be displayed.

4,631,599

SELECTIVE OPTOELECTRONIC COPIER

Anthony E. Cawkell, Uxbridge, Great Britain, assignor to Institute for Scientific Information, Inc., Philadelphia, Pa.

Filed Oct. 5, 1984, Ser. No. 657,913
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—285 **12 Claims**

1. Apparatus for selectively storing and copying one or more portions of an image, comprising:

(a) optoelectronic sensor means for making first and second optical scans of the entire image and generating an electronic signal representative of the image,

(b) means for storing the electronic signal from the first optical scan in a memory,

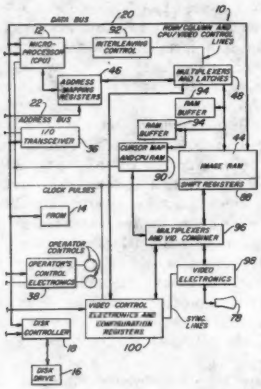
(c) means for selectably reducing the effective resolution of the sensor means to selectably reduce the the amount of memory space required for storage of the electronic signal,

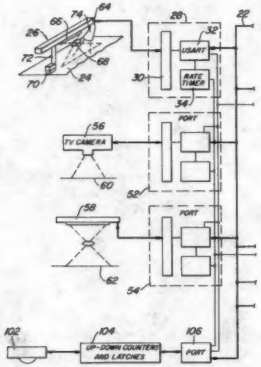
(d) means operatively associated with the electronic scanning means for selecting the portions of the entire image to be copied,

(e) write means responsive to the selecting means and the second optical scan for causing portions of the electronic signal corresponding to the portions of the image to be copied to over-write the signal from the first optical scan in said memory,

(f) read means for causing the portions of the electronic signal corresponding to the portions of the image to be copied to be recalled from the memory without gaps between the selected portions, and

(g) output means for presenting the recalled portions of the electronic signal to means for transmitting the recalled





portions over a telecommunications channel to a remote location.

4,631,600

TIME-AXIS CORRECTING CIRCUIT FOR RECORDED DATA REPRODUCING DEVICE

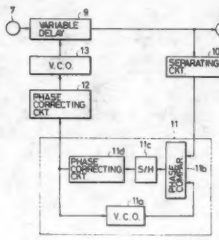
Tsutomu Fukui, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1984, Ser. No. 603,379
Claims priority, application Japan, Apr. 28, 1983, 58-73903
Int. Cl.[4] H04N *9/493, 5/781*
U.S. Cl. 358—320 **7 Claims**

1. A time-axis correcting circuit for a recorded data reproducing device, comprising:

a first time-axis correcting circuit, comprising a first flywheel oscillator loop, for suppressing a time-axis error component having a frequency equal to a first predetermined oscillation frequency of said first flywheel oscillator servo loop; and

a second time-axis correcting circuit, comprising a second flywheel oscillator loop, for suppressing a time-axis error component having a frequency equal to a second predetermined oscillation frequency of said second flywheel oscillator servo loop different from said first predeter-



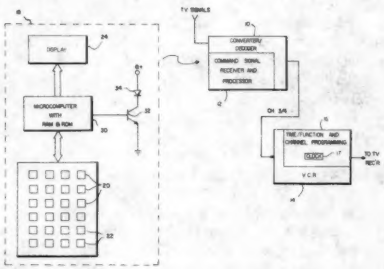
mined oscillation frequency, said first and second time-axis correcting circuits being cascade connected.

4,631,601

TIME PROGRAMMABLE CONTROL SYSTEM FOR A CONVERTER/VCR SYSTEM

Vito Brugliera, Evanston; George R. J. Green, Algonquin, and Michael E. Long, Western Springs, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 5, 1984, Ser. No. 658,105
Int. Cl.[4] H04N *5/782*
U.S. Cl. 358—335 **5 Claims**



1. In combination:

a converter for receiving a plurality of television signals at different channel frequencies, converting them to a single channel frequency and supplying said single channel frequency to an output;

selection means in said converter for selecting among said different channel frequencies in response to remotely transmitted channel command signals;

a VCR having an input coupled to the output of said converter and tuned to said single channel frequency for recording television signals therefrom;

program means, including timer means, in said VCR for initiating and terminating recording by said VCR in response to a user programmed time schedule for said timer means; and

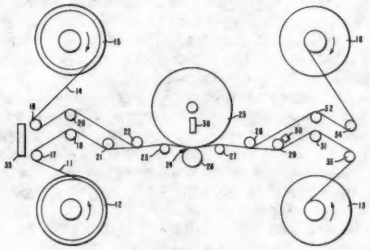
user programmable remote transmitter means, including timer means, for automatically transmitting channel command signals to operate said selection means in said converter to convert user desired channel frequency signals to said single channel frequency at said output for recording by said VCR when said VCR is programmed by a user to correspond with said programmed time schedule.

4,631,602

PROCESS FOR THERMOREMANENT DUPLICATION OF MAGNETIC TAPES USING TRANSVERSE LASER BEAMS SPANNING THE TAPE WIDTH

Michael P. Chouinard, Newark, and Lewis C. Bancroft, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 449,277, Dec. 13, 1982, abandoned.
This application Sep. 11, 1985, Ser. No. 774,885
Int. Cl.[4] G11B 5/86, 15/60
U.S. Cl. 360—16 26 Claims



16. A process for replicating a magnetic pattern on a moving flexible magnetizable recording member containing a particulate layer with chromium dioxide particles on a flexible support transparent to a beam of energy which comprises

(a) passing the magnetizable recording member and a flexible prerecorded magnetizable medium into pressure contact with one another whereby said contact is maintained during steps (b) and (c), with the chromium dioxide particles facing said prerecorded magnetizable medium wherein the prerecorded magnetizable medium has a higher Curie temperature than the layer with chromium dioxide particles of the magnetizable recording member,

(b) passing a beam of continuous energy through the flexible support of the magnetizable recording member to simultaneously heat chromium dioxide particles across the width of the recording member on which a magnetic pattern is to be replicated for a time period in the range of from 0.01 to 5 milliseconds while in contact with the prerecorded magnetizable medium, said chromium dioxide particles being heated to above their Curie temperature,

(c) cooling the chromium dioxide particles to below their Curie temperature while in intimate contact with the prerecorded medium for a time period in the range from 0.1 to 100 milliseconds.

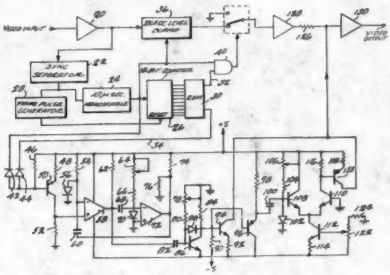
4,631,603

METHOD AND APPARATUS FOR PROCESSING A VIDEO SIGNAL SO AS TO PROHIBIT THE MAKING OF ACCEPTABLE VIDEO TAPE RECORDINGS THEREOF

John O. Ryan, Santa Clara, Calif., assignor to Macrovision, San Jose, Calif.

Filed Apr. 17, 1985, Ser. No. 724,006
Int. Cl.[4] H04N 5/91
U.S. Cl. 360—37.1 20 Claims

1. A method for processing a video signal so as to inhibit the making of acceptable videotape recordings therefrom while producing a normal color picture on a television receiver, wherein the video signal has a blanking interval which includes a sync pulse, said method comprising the step of adding a plurality of ordered pseudo-sync pulse and positive pulse pairs to said video signal following said sync pulse and within said blanking interval, whereby said added pulse pairs cause an automatic gain control system in a videotape recorder to sense an erroneous indication of video signal level and produce a



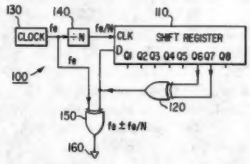
gain correction that results in an unacceptable videotape recording.

4,631,604

BIASING FOR MAGNETIC CIRCUITS

Bruce E. Randall, Alpharetta, Ga., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Dec. 24, 1984, Ser. No. 685,503
Int. Cl.[4] G11B 5/03, 5/02
U.S. Cl. 360—66 8 Claims



1. A method of biasing a magnetic circuit to which is applied a periodic signal of interest comprising the steps of:

generating a sequence of biasing signals having a random frequency distribution with respect to said periodic signal, wherein said biasing signals are random noise signals; and

applying said sequence of biasing signals to said magnetic circuit.

4,631,605

MULTIPLE SPEED SCANNER SERVO SYSTEM FOR PROTECTING THE HEADS AND TAPE OF HELICAL RECORDERS

David C. O'Gwynn, Colorado Springs, Colo., assignor to Ampex Corporation, Redwood City, Calif.

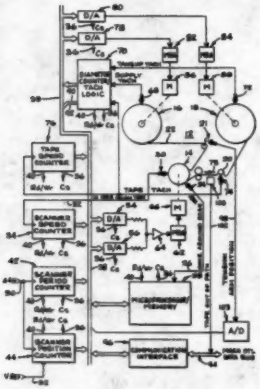
Filed Sep. 20, 1984, Ser. No. 653,651
Int. Cl.[4] G11B 15/66, 5/52
U.S. Cl. 360—70 20 Claims

1. A scanner servo system for a tape transport having supply and takeup reels, and a rotating scanner about which the type may be unthreaded and threaded during a corresponding mode of transport operation wherein the tape is moved in the reverse direction, said transport including a normal record/playback mode of operation, comprising:

a first scanner servo circuit for generating scanner control signals to drive the scanner at a speed commensurate with the normal record playback mode of operation;

a second scanner servo circuit for generating control signals to controllably maintain the scanner at a preselected reduced speed substantially below the normal scanner record/playback speed; and

a processor device for enabling the second scanner servo circuit in place of the first scanner servo circuit only in



response to the unthreading and threading modes of operation in the reverse tape direction.

4,631,606

SYSTEM FOR DETECTING THE POSITION OF A READ-WRITE HEAD ON A DISK RECORDING MEDIUM HAVING SERVO SECTORS WITH THREE OR MORE SERVO PATTERNS

Toshihiro Sugaya, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

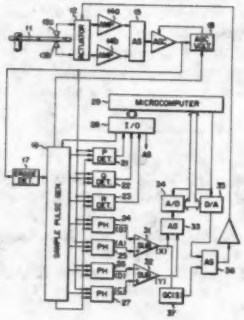
Filed Mar. 5, 1984, Ser. No. 586,440

Claims priority, application Japan, Mar. 11, 1983, 58-40370

The portion of the term of this patent subsequent to Jul. 8, 2003, has been disclaimed.

Int. Cl.[4] G11B *21/08, 21/10*

U.S. Cl. 360—78 **7 Claims**



1. A disk recording medium having a plurality of data sectors each having concentric data tracks and servo sectors each having concentric servo tracks and embedded between adjacent data sectors, characterized in that each servo sector has K (an integer of not less than 3) servo information patterns which consist of a first servo pattern consisting of a first pair of alternate pattern arrays having a period of four tracks and arranged in a staggered fashion, and a second pair of alternate pattern arrays having a period of four tracks and arranged in a staggered fashion, said first and second pairs of alternate pattern arrays being displaced by one track with respect to each other; a second servo pattern consisting of a pair of alternate pattern arrays having a period of 2^{K+1} tracks and displaced by 2^{K-1} tracks with respect to each other; and a kth servo pattern consisting of an alternate pattern array having a period of 2^{K-k+3} (k includes all intergers of not less than 3 and not more than K) tracks and displaced by 2^{K-k+1} tracks with respect to a (k−1)th servo pattern.

7. A tracking servo system for positioning a read-write head on a target track of a disk recording medium having a plurality of data sectors each having concentric data tracks and servo sectors each having concentric servo tracks and embedded between adjacent data sectors, each servo sector having K (an integer of not less than 3) servo patterns which consist of a first servo pattern consisting of a first pair of alternate pattern arrays having a period of four tracks and arranged in a staggered fashion, and a second pair of alternate pattern arrays having a period of four tracks and arranged in a staggered fashion, said first and second pairs of alternate pattern arrays being displaced by one track with respect to each other; a second servo pattern consisting of a pair of alternate pattern arrays having a period of 2^{K+1} tracks and displaced by 2^{K-1} tracks with respect to each other; and a kth servo pattern consisting of an alternate pattern array having a period 2^{K-k+3} (k includes all intergers of not less than 3 and not more than K) tracks and displaced by 2^{K-k+1} tracks with respect to a (k−1)th servo pattern, comprising:

head driving means for driving said read-write head in the radial direction of said disk recording medium;

detecting means for detecting servo signals, corresponding to said pattern arrays of said servo patterns from an output signal of said read-write head obtained at each of said servo sectors; and

controlling means responsive to the servo signals from said detecting means for controlling said head driving means to position said read-write head on the target track.

4,631,607

CASSETTE LOADING DEVICE

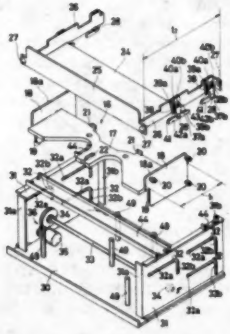
Hiroshi Katsumata, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 3, 1984, Ser. No. 657,355

Claims priority, application Japan, Oct. 7, 1983, 58-188847

Int. Cl.[4] G11B *15/66*

U.S. Cl. 360—96.5 **11 Claims**



1. A cassette loading device movable between a cassette inserting position and a cassette loading position lying thereunder after insertion of a cassette in the cassette inserting position, and upon movement to the cassette loading position a positioning element is arranged for positioning the cassette, the cassette loading device comprising:

a channel-shaped cassette holder opened at a top of the channel;

a cassette pressing plate arranged above said cassette holder so as to cover said cassette holder; and

engagement means including a first element affixed to said

cassette holder and a second element affixed to said cassette pressing plate, said first and second elements being arranged for mutual engagement, whereby motion in a selected direction of said cassette holder causes motion of said cassette pressing plate;

a pressing means affixed to said second element of said engagement means for pressing said cassette pressing plate on an upper surface of said cassette holder upon engagement of said first and second elements,

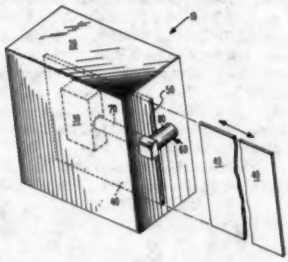
whereby, upon said cassette holder being moved downward from said cassette inserting position to said cassette loading position, a top face of said cassette is pushed in the downward direction by said cassette pressing plate on which a thrust of said pressing means acts, so as to press and position said cassette on said positioning element.

4,631,608

DISK DRIVE DISK CONTROL APPARATUS

George A. Sudol, Mine Hill, N.J.; Edward H. Comfort, Morrisville, Pa., and Stephen R. Solomon, Cranford, N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jul. 23, 1984, Ser. No. 633,634
Int. Cl.[4] G11B 5/016
U.S. Cl. 360—99 4 Claims



1. A magnetic disk drive for data processing apparatus comprising

a housing;

electronic apparatus in said housing for engaging a magnetic disk and reading information on said disk;

an operating knob positioned outside said housing, a shaft rotatably disposed in said housing for coupling said knob to said electronic apparatus, whereby the concurrent rotation of said knob and said shaft causes said electronic apparatus to selectively engage and disengage said magnetic disk; and

a first slot in said housing into which a diskette including said magnetic disk can be inserted;

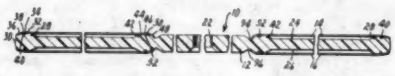
said knob including a finger-engaging portion having a second slot, a plate loosely seated in said slot, spring means disposed in said second slot, said plate having a pair of opposed edges, a first of said edges contacting and compressing said spring means and a second of said edges being urged against the surface of said housing adjacent said first slot by said spring means, said knob being positioned such that, when it rotates, it tends to traverse said first slot, whereby if said diskette is only partially inserted in said first slot, said plate impacts said diskette and prevents said knob from fully rotating, thereby precluding engagement of said magnetic disk by said electronic apparatus, or, if said diskette is substantially but not fully inserted in said first slot, said plate pushes against the trailing edge of said diskette, fully seating and maintaining the latter properly within said first slot and inside said housing.

4,631,609

STRETCHED SURFACE RECORDING DISK SUBSTRATE

Leif O. Erickson, Hudson, Wis., and Vurnen J. Leonard, Minneapolis, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 16, 1984, Ser. No. 580,892
Int. Cl.[4] G11B 5/82
U.S. Cl. 360—135 7 Claims



1. A stretched surface recording disk including an annular substrate and an annular or circular film stretched across at least one of the major surfaces of said substrate and adhesively secured thereto, said substrate comprising:

a raised annular first ridge adjacent the outer periphery of said substrate, said first ridge projecting above said major surface to define a reference surface upon which said film is supported above said major surface and including a radially outward edge defining a fulcrum around which said film may be drawn downwardly toward said major surface to tension said film;

a raised, annular second ridge adjacent the inner diameter of said substrate, said second ridge projecting above said major surface a distance equal to the projection of said first ridge to define a reference surface upon which said film is supported above and parallel to said major surface and including a radially inward edge defining a fulcrum around which said film is drawn downwardly toward said major surface to tension said film;

an annular outer film attachment surface located radially outward of said first ridge and sloping from a point adjacent said first ridge fulcrum and intermediate said major surface and said first ridge fulcrum outwardly and downwardly toward the plane of said major surface;

an annular inner film attachment surface radially inward of said second ridge fulcrum and curved radially inwardly and downwardly toward said major surface from a point adjacent said second ridge fulcrum and intermediate said second ridge fulcrum and said major surface, said inner film attachment surface having a radius equal to or less than the radius of the contour assumed by said film as said film is drawn around said second ridge fulcrum toward said major surface; and

adhesive disposed on said inner and outer film attachment surfaces for securing said film to said substrate.

4,631,610

MULTICHANNEL MAGNETIC HEAD SUPPORTING MECHANISM

Akira Kobayashi, and Fukashi Yanagisawa, both of Nagano, Japan, assignors to Kabushiki Kaisha Sanyo Seiki Seisakusho, Nagano, Japan

Continuation of Ser. No. 456,905, Jan. 10, 1983, abandoned. This application Mar. 18, 1986, Ser. No. 842,063
Claims priority, application Japan, Jan. 18, 1982, 57-5549
Int. Cl.[4] G11B 5/48
U.S. Cl. 360—104 10 Claims

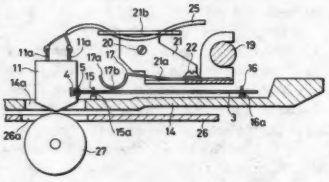
1. A multichannel magnetic head supporting mechanism, comprising:

a plurality of magnetic heads,

a plurality of associated head supporting members connected to and supporting said magnetic heads, each of said supporting members being independent of one another, and each having a longitudinal centerline normally falling in a first plane, said head supporting members each supporting a magnetic head at a position which is on said

centerline, said supporting members further including two insertion apertures on said centerline,

a plurality of associated holding members mounted on a stationary support structure for independently holding said supporting members, each of said holding members having a first portion which is receivable into a respective insertion aperture of one of said supporting members and a cone-shaped portion having a diameter which is larger than said insertion aperture, said holding members holding said supporting members in such a manner that at least two holding members hold an associated supporting member, said plurality of holding members being arranged in a plurality of lines, each of which is formed by said at least two holding members holding an associated supporting member, said lines being parallel to one another, said holding members holding said supporting members in



such a manner that each of said first portions of said holding members movably penetrates an associated insertion aperture of a supporting member and such that each of said cone-shaped portions of said holding members abut against sides of said insertion aperture so that said supporting members may move in a direction normal to a recording medium and swing with respect to said first plane,

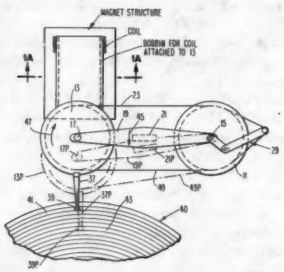
and means for biasing said head supporting members generally toward said recording medium, said biasing means comprising a plurality of independently movable biasing members provided in a number equal to that of said supporting members, each of said biasing members being in contact with its associated supporting member such that said supporting members are urged toward said recording medium while allowing longitudinal swinging of said supporting members.

4,631,611

READ/WRITE HEAD POSITIONER ARRANGEMENT

Guenter Schneider, Concord, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 6, 1983, Ser. No. 529,840
Int. Cl.[4] G11B *5/58, 21/08*
U.S. Cl. 360—106 **13 Claims**



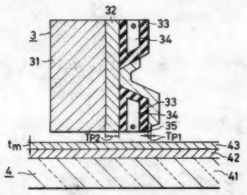
1. An arrangement to move a read/write head across a plurality of tracks on a magnetizable disk comprising in combination: a fixed member formed to hold first bearing means; a movable member formed to hold second bearing means; rigid means formed to include first and second bearing means, said first bearing means formed and disposed to be rotationally coupled to said fixed member and said second bearing means formed and coupled to said movable member to enable said movable member to rotate about said second bearing means, whereby said rigid means can effect a rotary movement relative to said fixed member and said movable member can effect a rotary movement relative to said second bearing means; flexible means formed and disposed to come in contact with a substantial section of said movable member, said substantial section lying away from said fixed member and said flexible means formed and disposed to be secured in tension to said fixed member; and read/write head assembly means secured to said movable member, whereby in response to said rotary movement of said rigid means said movable member is moved thereby moving said read/write head substantially radially across a magnetic disk.

4,631,612

MAGNETIC RECORDING AND REPRODUCING SYSTEM

Kazuo Shiiki, 2644-6, Kawashiri, Shiroyama-cho, Tsukui-gun, Kanagawa-ken; Yoshihiro Shiroishi, 2-32-A101, Koyasu-cho, Hachioji-shi, Tokyo; Isamu Yuito, 3-413, Chigase-machi, Ohme-shi, Tokyo; Kiminari Shinagawa, 3603-2, Kawashiri, Shiroyama-cho, Tsukui-gun, Kanagawa-ken; Yasutaro Uesaka, 3-17-40, Tokura, Kokubunji-shi, Tokyo; Hideo Fujiwara, 1272-50, Shimotomi, Tokorozawa-shi, Saitama-ken, and Hitoshi Nakamura, 3-24-19, Higashi-ohme, Ohme-shi, Tokyo, all of Japan

Filed Jul. 14, 1983, Ser. No. 513,615
Claims priority, application Japan, Jul. 14, 1982, 57-121117
Int. Cl.[4] G11B *5/127*
U.S. Cl. 360—125 **9 Claims**



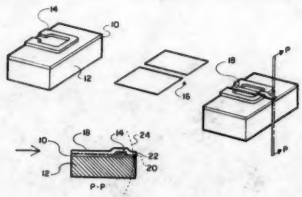
1. A magnetic recording and reproducing system comprising a perpendicular magnetic recording and reproducing head and a perpendicular magnetic recording medium, said head having a first magnetic pole and a second magnetic pole, in which said first magnetic pole, for magnetic recording and reproduction, is made of a magnetic material having a saturation flux density of at least 7 kG, and an edge face of the first magnetic pole confronting the recording medium, is 0.15–0.5 μm thick, while an edge face of the second magnetic pole, confronting the recording medium, the second magnetic pole lying on the same side as the first magnetic pole with respect to the recording medium, is at least 5 times thicker than the first magnetic pole, and the perpendicular magnetic recording medium comprises a magnetic thin film which is formed on a magnetic layer of high magnetic permeability directly or through an intermediate layer, which magnetic thin film has an easy magnetization axis in a direction nearly perpendicular to the plane of the film, and which magnetic thin film has a thickness of 0.1–0.5 μm and a coercive force in the direction perpendicular to the film plane of 250–600 Oe.

4,631,613

THIN FILM HEAD HAVING IMPROVED SATURATION MAGNETIZATION

William W. French, Cardiff, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 16, 1984, Ser. No. 600,857
Int. Cl.[4] G11B 5/12, 5/20
U.S. Cl. 360—125 10 Claims



1. A thin film magnetic head for recording in and/or reproducing from a magnetic recording medium, said head comprising

(a) means defining first and second magnetic poles, and

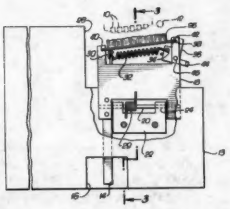
(b) means defining a nonmagnetic transducer gap between said poles, at least one of said magnetic poles being comprised of a thin film of an alloy of silicon, aluminum and iron, said alloy being richer in iron in that portion thereof which is in proximity to said transducer gap than that portion which is distal with respect thereto, said thin film being so disposed with respect to said head that both said proximate and distal portions reside at the same distance from said medium when said head is in use.

4,631,614

TAPE CARTRIDGE DRIVE HEAD CLEANER

C. Paul Davis, Woodland Hills, Calif., and Eli Neuman, Magdiel, Israel, assignors to Innovative Computer Products Corporation, Chatsworth, Calif.

Filed Nov. 18, 1982, Ser. No. 442,647
Int. Cl.[4] G11B 5/41
U.S. Cl. 360—128 11 Claims



1. A cleaning cartridge for use with cartridge tape drive systems having a plurality of magnetic heads arranged along a tape path, comprising:

a cartridge that is adapted for insertion into the drive system and includes an opening that is adjacent to the heads when the cartridge is inserted into the drive system;

a cleaning pad supported in the area of the opening, wherein the pad is adapted for contacting each of the heads when the cartridge is inserted into the drive system; and

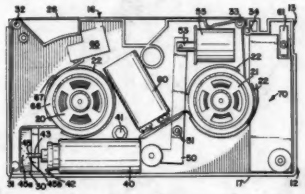
actuator means secured within the cartridge for moving the cleaning pad in a direction that is substantially perpendicular to the tape path thereby causing the cleaning pad to simultaneously clean the heads.

4,631,615

HEAD CLEANING CASSETTE FOR A VIDEO CASSETTE RECORDER

Craig B. Grossman, Minnetonka; Mark A. Schwartz, Crystal, and Stanley S. Hammer, Minnetonka, all of Minn., assignors to Video Dynamics, Inc., St. Louis Park, Minn.

Filed May 31, 1985, Ser. No. 739,990
Int. Cl.[4] G11B 5/10
U.S. Cl. 360—128 3 Claims



1. Head cleaning apparatus for use in cleaning the heads of a video cassette recorder, comprising:

(a) video cassette tape housing means including means for supporting a pay-out spool and a take-up spool adapted to be rotated by the winding mechanism of a video cassette recorder, a fluid absorptive cleaning tape disposed between said spools and guide means for guiding said tape between said spools along a tape path traversing the front end of said housing means;

(b) fluid applicator means for dispersing a cleaning fluid onto said cleaning tape, said applicator means disposed inside said housing means adjacent said tape path between said pay-out spool and said front end;

(c) reservoir means for holding a supply of head cleaning fluid disposed within said housing means;

(d) valve means for selectively connecting said reservoir means in fluid communication with said applicator means so that cleaning fluid may be selectively delivered to said applicator means by opening said valve means;

(e) detector means responsive to the rotation of one of said spools for producing an electrical signal indicating that said tape is being wound from spool to spool by the winding mechanism of a video cassette recorder;

(f) means responsive to said electrical signal for opening said valve means temporarily and thereby cause cleaning fluid to be applied to said tape; and

(g) audible alarm means for indicating that a desired head cleaning time interval has elapsed from the time that cleaning fluid was applied to said tape, whereby the user is alerted to remove the head cleaning apparatus from the video cassette recorder.

4,631,616

CLEANING CASSETTE FOR TAPE RECORDER AND/OR PLAYER MAGNETIC HEAD

Giovanni Zago, Via N. Aprilis, 41, 33080 San Quirino (Prov. of Pordenone), and Giovanni Prataviera, Via Caorle, 4, 33170 Pordenone, both of Italy

Filed Mar. 19, 1984, Ser. No. 591,084
Claims priority, application Italy, Mar. 24, 1983, 21274/83[U]
Int. Cl.[4] G11B 5/41; A47L 25/00
U.S. Cl. 360—128 4 Claims

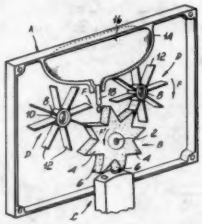
1. A device for cleaning heads of a cassette tape recorder or player, comprising:

a cassette casing insertable into the cassette recorder or player in juxtaposition with the heads, the casing defining two apertures therethrough to accomodate spindles of the recorder or player;

a rotary drive member associated with each said aperture of the casing, each drive member having a hub with serrations for engaging serrations of a spindle in a torque trans-

fer relationship, and having a plurality of vanes extending radially from the hub; and

a rotary cleaning member being rotatable about a pin, the cleaning member having elastic radially extending teeth,



and the cleaning member being positioned in the casing so that the elastic teeth drivingly engage the vanes of the drive members and also may frictionally engage the heads of the recorder or player when the device is inserted therein.

4,631,617

MAGNETO-OPTICAL RECORDING MEDIUM

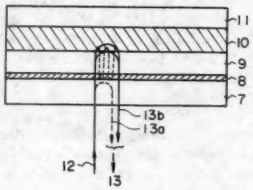
Fujio Tanaka, and Nobutake Imamura, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1983, Ser. No. 509,189

Claims priority, application Japan, Sep. 14, 1982, 57-160422

Int. Cl.⁴ G11B *5/74, 5/66*

U.S. Cl. 360—131 **2 Claims**



1. A magneto-optical recording thin film, in which a transparent synthetic resin substrate/defining a light incidence side, a light transparent thin film of metal or a metal compound, a dielectric layer, a recording medium layer formed of an amorphous alloy having an easy axis of magnetization in a direction perpendicular to the film surface and thick enough to reflect light, and a protective film are provided in this order from said light incidence side.

4,631,618

TAPE CASSETTE WITH PROTECTION COVER AND TAPE END SENSING MEANS

Kazuo Ozawa, Miyagi, and Hideki Nonoyama, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 25, 1984, Ser. No. 603,749

Claims priority, application Japan, Apr. 29, 1983, 58-75710

Int. Cl.⁴ G11B *23/02*

U.S. Cl. 360—132 **1 Claim**

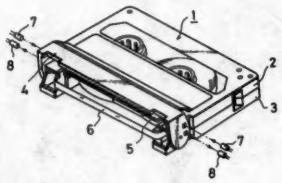
1. In combination in a tape cassette having a casing, a lid with a front portion for protecting a tape stretched and transported over a front opening portion of the cassette casing and side portions extending therefrom,

(a) means for pivotally supporting said lid side portions at both side portions of said cassette casing;

(b) first and third apertures formed through a side portion of said lid;

(c) second and fourth apertures formed through said cassette casing of said tape cassette; and

(d) a sensor chip provided inside said cassette casing and optically exposed to said second and fourth apertures to provide for an optical path from outside said cassette casing through one of said second and fourth apertures, through said sensor chip and said tape and back outside said cassette casing through the other of said second and



fourth apertures, said apertures being positioned that when said tape cassette is in a using state with said lid opened, said first and third apertures are aligned with said second and fourth apertures and the optical path is clear except for the tape while when said tape cassette is in a non-using state with said lid closed, said first and third apertures are unaligned with said second and fourth apertures and said lid side portions close off said second and fourth apertures protecting said sensor chip disposed inside said tape cassette casing.

4,631,619

MAGNETIC TAPE CASSETTE HAVING IMPROVED REEL LOCKING MEANS

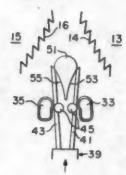
Kenji Hashizume; Haruo Shiba, and Masatoshi Okamura, all of Saku, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Feb. 20, 1985, Ser. No. 703,438

Claims priority, application Japan, Mar. 7, 1984, 59-31713[U]

Int. Cl.⁴ G11B *23/02, 15/32, 23/04;* **G03B** *1/04*

U.S. Cl. 360—132 **4 Claims**



1. A magnetic tape cassette comprising:

a locking means slidably placed between a locking position of coming into engagement with a pair of reels held in said magnetic tape cassette and a releasing position of disengagement from said reels;

a pair of flexible pawls which are fixed to said locking means and are curved in an arch form in a direction of separation from each other

a tapered guide rib fixed to an inner bottom surface of a cassette casing and between said pair of flexible pawls, the width of said guide rib decreasing toward a root of said pair of flexible pawls; and

a pair of fixed guide pins provided at opposite sides of said pair of flexible pawls in said direction of separation, whereby when said locking means is advanced to said locking position, said flexible pawls are forcibly opened by tapered surfaces of said guide rib and engage with said reels and when said locking means is retracted to said

releasing position, said flexible pawls are forcibly closed by said guide pins.

4,631,620

MAGNETIC DISK CARTRIDGE

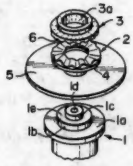
Kengo Oishi, and Shingo Katagiri, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Mar. 18, 1985, Ser. No. 712,979

Claims priority, application Japan, Apr. 12, 1984, 59-54592[U]

Int. Cl.⁴ G11B *23/03*

U.S. Cl. 360—133 **2 Claims**



1. A magnetic disk cartridge comprising

a disk-shaped recording medium formed of a flexible material;

a center core disposed at the center of said recording medium for the rotation thereof which comprises a main core, a resilient ring and an upper core arranged concentrically one on the other in that order, with the recording medium being held between the main core and the resilient ring; and

a cartridge casing which integrally houses said recording medium and said center core;

wherein the resilient ring has radially extending ridges formed on the side which contacts the upper core and is provided on its other side with double-sided adhesive tape, and the upper core is provided with a plurality of grooves extending radially across the whole of the surface which comes into contact with the resilient ring for engagement with the ridges of the resilient ring.

4,631,621

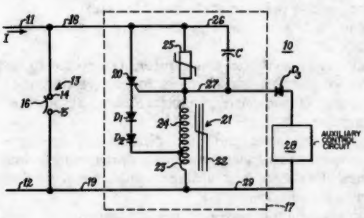
GATE TURN-OFF CONTROL CIRCUIT FOR A SOLID STATE CIRCUIT INTERRUPTER

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jul. 11, 1985, Ser. No. 754,032

Int. Cl.⁴ H01H *9/42*

U.S. Cl. 361—13 **7 Claims**



1. A circuit interrupter comprising:

a pair of separable contacts serially connected within an electric circuit;

a gated semiconductor device connected across said contacts for transferring circuit current away from said contacts upon separation; and

control means in circuit with said gated semiconductor device for turning on said gated semiconductor device immediately upon separation of said contacts and for turning off said gated semiconductor device a predetermined time thereafter, said control means including a current transformer connected in series with said gated semiconductor device, a secondary winding of said current transformer being connected to the cathode and gate of said gated semiconductor device to provide regenerative gate current to said gate,

said current transformer comprising a saturable core for interrupting said gate current to turn off said gated semiconductor after a predetermined time delay.

4,631,622

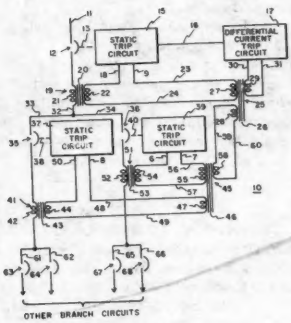
MULTIPLE STATIC TRIP CIRCUIT BREAKER COORDINATION

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Dec. 31, 1984, Ser. No. 687,880

Int. Cl.⁴ H02H *3/28*

U.S. Cl. 361—45 **5 Claims**



1. A static trip circuit breaker coordination system comprising:

a first pair of separable contacts connected with a first current sensing transformer and controlled by a differential current trip circuit within a protected circuit;

a second pair of separable contacts in series with and downstream from said first contacts and connected with a second current sensing transformer;

a third pair of separable contacts downstream from said first contacts connected in parallel with said second contacts and connected with a third current sensing transformer;

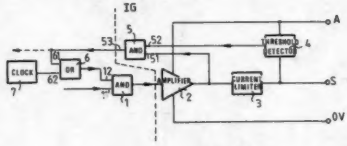
a first differential current transformer connected with said second and third transformers for vectorial summing of downstream current through said second and third contacts; and

a second differential current transformer connected with said first current sensing transformer and said first differential current transformer for vectorial subtracting of upstream current from said downstream current and opening said first contacts to interrupt said protected circuit upon the occurrence of a predetermined difference.

4,631,623
DC POWER CONTROL CIRCUIT WITH STATUS REPORTING AND PROTECTION AGAINST OVERLOADS AND SHORT CIRCUITS

Pierre Gohl, La Colle sur Loup, France, assignor to La Telemecanique Electrique, France

Filed Dec. 6, 1984, Ser. No. 678,855
Claims priority, application France, Dec. 6, 1983, 83 19465
Int. Cl.[4] H02H *3/26*
U.S. Cl. 361—86 **3 Claims**



1. A DC power control device comprising:

i- an output stage including an output amplifier having an input and an output, a current limiter connected to the output of said output amplifier, said current limiter having an output, a source of power supply voltage for said output stage and a threshold detector comparing the difference between the power supply voltage from said source and the voltage at the output of said current limiter to a predetermined threshold voltage, said threshold detector having an output on which a non overload signal is generated when said difference is less than said predetermined threshold voltage;

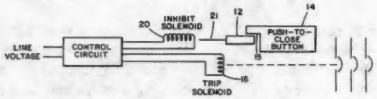
ii- means for applying a control logic signal to the input of said output amplifier;

iii-first AND circuit means having an output, a first input connected to the output of said output amplifier and a second input connected to the output of the threshold detector, said first AND circuit means generating a report signal when the non overload signal is generated and the power supply voltage is present.

4,631,624
TIME DELAY UNDERVOLTAGE RELEASE

Robert F. Dvorak, Mount Vernon; Harley W. Jansen, Marion, and Henry J. Zylstra, Alburnette, all of Iowa, assignors to Square D Company, Palatine, Ill.

Filed Nov. 2, 1984, Ser. No. 667,928
Int. Cl.[4] H02H *3/247*
U.S. Cl. 361—89 **17 Claims**



1. A circuit breaker comprising:

separable contacts;

an operating mechanism to open and close the separable contacts;

an activation button to signal the operating mechanism to close the separable contacts;

a control voltage source;

test means coupled to said control voltage source for establishing a test voltage proportional to said control voltage;

reference means coupled to said control voltage source for establishing a reference voltage;

an inhibit solenoid having a plunger with a first position and a second position, said inhibit solenoid being connected to the operating mechanism to open the separable contacts upon activation of said solenoid means;

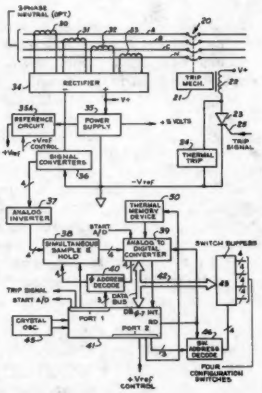
a pin connected to said inhibit solenoid and adapted to obstruct the operation of the activation button when the plunger is in the first position; and

differential means having inputs connected to said test means and to said reference means and having an output connected to said inhibit solenoid, said differential means activating said inhibit solenoid and causing said inhibit solenoid plunger to move to the first position whenever the test voltage drops below the reference voltage, said differential means causing said inhibit solenoid plunger to move to the second position whenever the test voltage rises above the reference voltage.

4,631,625
MICROPROCESSOR CONTROLLED CIRCUIT BREAKER TRIP UNIT

James O. Alexander, Clarkston; William A. King, Lithonia; William E. May, Lawrenceville, and Von G. Pardue, Duluth, all of Ga., assignors to Siemens Energy & Automation, Inc., Atlanta, Ga.

Filed Sep. 27, 1984, Ser. No. 655,152
Int. Cl.[4] H02H *3/08*
U.S. Cl. 361—94 **18 Claims**



1. A microprocessor based circuit breaker trip unit comprising, in combination:

a plurality of current transformers connected to corresponding lines of a multiphase circuit which are connected to respective poles of said circuit breaker;

a trip mechanism energizable to open said poles of said circuit breaker;

respective signal conversion means connected to said plurality of current transformers for converting the current output of said current transformers to respective voltage signals;

respective sample and hold circuits for repetitively and simultaneously sampling and holding sample analog values of each of said voltage signals for a predetermined number of samples;

analog-to-digital converter means connected to each of said respective sample and hold circuits for converting the analog value produced in said sample and hold cirucit after said predetermined number of samples of a corresponding digital value;

a microprocessor means coupled to each of said analog-to-digital converters for computing a true RMS value of the current of each of said line from said predetermined number of samples; and

an output circuit means connected between said microcom-

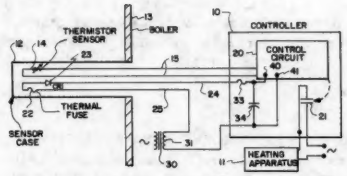
puter and said trip mechanism for operating said trip mechanism in response to predetermined current conditions.

4,631,626

TEMPERATURE CONTROLLER WITH TEMPERATURE LIMITING SENSOR

John E. Bohan, Jr., Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 27, 1985, Ser. No. 780,787
Int. Cl.⁴ H02H *5/04*
U.S. Cl. 361—104 **6 Claims**



1. In a temperature limiting circuit for a sensor and controller ccmprising,

a remote sensor comprising temperature responsive switch means providing an open circuit at a predetermined temperature and a unidirectional current conducting means connected in series to two output terminals,

a temperature controller having a two terminal power input circuit, comprising a current responsive switch means opening at a predetermined current connected to a first of said two terminals and a capacitance connected between said current responsive switch means and a second of said two terminals,

a source of alternating current power, and

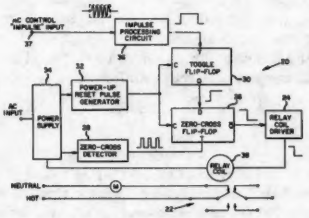
circuit means including said two output terminals of said remote sensor for connecting said source of power to said power input circuit whereby, upon said remote sensor having a short between said two output terminals, said current responsive switch means opens to disconnect said source of power from said controller.

4,631,627

IMPULSE OPERATED RELAY SYSTEM

Ronald E. Morgan, 5900 SE. Yamhill, Portland, Oreg. 97215

Filed May 9, 1985, Ser. No. 732,520
Int. Cl.⁴ H02N *7/22*
U.S. Cl. 361—153 **18 Claims**



1. An impulse relay control circuit for controlling a relay powered by an interruptable power signal, comprising:

means connectable to a power line for inputting the power signal to the circuit;

reset means for generatring a reset pulse signal in response to an initiation of the power signal on the power line;

means for inputting an AC impulse control signal to the circuit;

logic means responsive to successive occurrences of the AC impulse control signal for alternately generating first and second logic signals;

relay energizing means responsive to the first and second logic signals for energizing and deenergizing the relay; and

initializing means responsive to the reset pulse signal for initially applying said second logic signal to the relay energizing means to deenergize the relay;

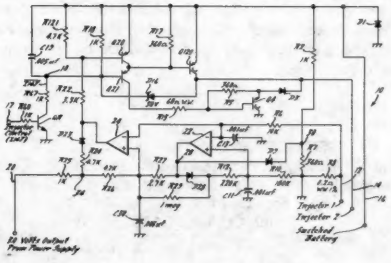
the logic means including preset means responsive to the reset signal for presetting the logic means so that the first logic signal following initiation of the power signal energizes the relay.

4,631,628

ELECTRONIC FUEL INJECTOR DRIVER CIRCUIT

William R. Kissel, Milford, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jun. 8, 1983, Ser. No. 502,410
Int. Cl.⁴ H01H *47/32*
U.S. Cl. 361—154 **4 Claims**



1. An electronic driver circuit for controlling the energization of a solenoid coil, forming part of an electromagnetic fuel injection valve, in response to an injector control pulse, produced by a main fuel injection control circuit, comprising:

a current regulating circuit including a power transistor connected in series with said coil, forming part of an electromagnetic fuel injection valve, and a current sensing resistor between a power source and ground, and a first switching transistor responsive to said injector control pulse, produced by a main fuel injection control circuit, for controlling the actuation of said power transistor;

a free-wheeling circuit connected in parallel with said power transistor and including a diode and a second switching transistor actuation of which is also controlled by said first switching transistor so that said free-wheeling circuit is operative to allow current to flow to said solenoid coil, forming part of an electromagnetic fuel injection valve, during said injector control pulse, produced by a main fuel injection control circuit;

a first comparator having one input thereof connected to said current sensing resistor and its other input thereof connected to receive a first reference signal from a reference circuit, said first reference signal being set so that said first comparator switches output states when the current through said coil attains a predetermined peak current value; the output of said first comparator being connected to said reference circuit for changing the value of said first reference signal when said first comparator switches output states so that said first comparator will not switch back to its original output state until the current through said coil, forming part of an electromagnetic fuel injection valve, is substantially equal to zero; and

a second comparator having its output connected to a third switching transistor which is in turn connected to said power transistor for controlling the actuation of said

power transistor, said second comparator having one input thereof connected to said current sensing resistor and its other input connected to receive a second reference signal from said reference circuit; said second reference signal being set so that initially said second comparator switches output states in response to said first comparator switching output states to thereby actuate said third switching transistor and deactuate said power transistor; said second reference signal being thereafter changed by the effect of the switched output state of said first comparator on said reference circuit to a voltage value substantially equal to the voltage across said current sensing resistor when the current through said coil, forming part of an electromagnetic fuel injection valve, is equal to a predetermined hold current level; said second comparator further having positive feedback for providing a hysteresis effect to said second comparator for oscillating the output of said second comparator to cycle said power transistor on and off to substantially maintain the current through said coil, forming part of an electromagnetic fuel injection valve, at said predetermined hold current level;

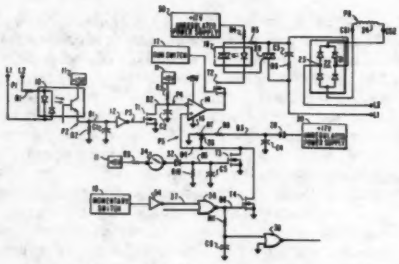
said free-wheeling circuit remaining actuated during the off periods of said power transistor so that the current through said coil, forming part of an electromagnetic fuel injection valve, decays slowly when said power transistor is off.

4,631,629

SOLENOID CONTROL CIRCUIT

George T. Mallick, Jr., Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 13, 1985, Ser. No. 775,917
Int. Cl.[4] H01H *47/22*
U.S. Cl. 361—154 **8 Claims**



1. Electrical apparatus comprising:

an electrically operated solenoid;

line voltage means at a line voltage level for supplying a source of current to said solenoid;

operable switch means interconnected between said line voltage means and said solenoid for regulating the flow of current from said line voltage means to said solenoid; and

control circuit means coupled to said switch means for controlling the operation of said switch means, said control circuit means operating said switch means to increase the duration of current flow to said solenoid when said line voltage level decreases and comprising:

means for generating a reference voltage independent of said line voltage level;

means for generating a control voltage proportional to said line voltage level; and

means for operating said switch means to permit current flow to said solenoid whenever said control voltage exceeds said reference voltage.

4,631,630

METHOD OF SUPPRESSING THE EFFECTS OF STATIC ELECTRICITY IN A TUMBLE DRIER FOR TEXTILE GOODS

Thomas F. Beane, P.O. Box 708, Concord, N.C. 28025

Filed Jan. 2, 1986, Ser. No. 815,509
Int. Cl.[4] H05F *3/00*
U.S. Cl. 361—212 **12 Claims**

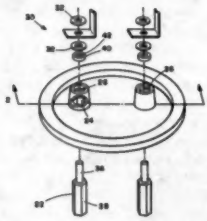
1. A method of suppressing the effects of static electricity in the operation of a tumble drier for textile goods and comprising the steps of preparing a textile fabric containing an electrically conductive strand material, including the prepared textile fabric in a batch of textile goods to be processed in the tumble drier, and drying the goods while dissipating through the prepared textile fabric static electrical charges otherwise possibly accumulating on and in the textile goods during drying.

4,631,631

CAPACITOR COVER AND TERMINAL CONNECTION

C. Wayne Hodges, and Jozef K. Limanowski, both of Huntsville, Ala., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Oct. 3, 1985, Ser. No. 783,690
Int. Cl.[4] H01G *9/00, 1/14;* H05K *5/00*
U.S. Cl. 361—306 **7 Claims**



1. A capacitor cover and terminal connection which comprises:

a disc fabricated of an electrically insulative material, at least one aperture in said disc,

keying means in a first portion of said aperture,

an elastic bushing fabricated of an electrically insulative material carried in a second portion of said aperture,

a metal insert extending through said bushing and having an outer face adapted to engage said keying means to thereby provide an antitwist characteristic between said disc and said insert,

receiving means within said insert adapted to receive an electrical terminal, and

retaining means holding an internal electrical lead into electrical contact with said metal insert.

4,631,632

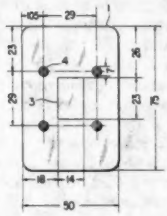
IMPREGNATED CAPACITOR

Masafumi Kano, Otsu; Megumu Tanaka, Otsuhachiman; Atsushi Sato, Tokyo, and Shigenobu Kawakami, Ichikawa, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Sep. 24, 1985, Ser. No. 779,697
Claims priority, application Japan, Sep. 26, 1984, 59-199419
Int. Cl.[4] H01G *4/22, 4/32*
U.S. Cl. 361—315 **6 Claims**

1. An impregnated capacitor wherein at least part of the capacitor element comprises a metallized film comprising a polypropylene film as a base film impregnated with an insulating impregnating agent comprising a compound having three

condensed or non-condensed aromatic rings, the ratio of the amount of the impregnating agent which penetrates between



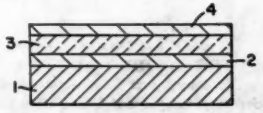
the base film layers to that of said agent which penetrates into the base film per unit thickness (μ) being at least 60.

4,631,633

THIN FILM CAPACITORS AND METHOD OF MAKING THE SAME

Avner A. Shaulov, Monsey; Stanley J. Lukasik, Hawthorn; Myron H. Frommer, Monsey, and Walter K. Zwicker, Scarborough, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Dec. 23, 1985, Ser. No. 812,158
Int. Cl.⁴ H01G *3/075, 1/01, 4/10*
U.S. Cl. 361—321 **11 Claims**



1. A thin film capacitor having a low temperature coefficient of capacitance and a high capacitance density, said capacitor consisting essentially of a thin crystalline electrically insulative substrate, a first thin crystalline film of a conductive metal situated on a surface of said thin substrate, a thin film of crystalline strontium barium niobate having a composition of the formula $Sr_{1-x}Ba_xNb_2O_6$ wherein $25 \leq x \leq 75$ and having 2.77 Å spaced atomic planes oriented non-perpendicularly to said surface of said thin substrate situated on said first crystalline film of a conductive metal and a second thin film of a conductive metal situated on the surface of said crystalline film of strontium barium niobate.

4,631,634

LIGHTING CIRCUIT BREAKER PANELBOARD MODULAR ASSEMBLY

Rodney D. Raabe; Joseph J. Mrowka; Jon P. McCain, all of Bristol, and Joseph F. Noonan, Manchester, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Feb. 25, 1985, Ser. No. 705,454
Int. Cl.⁴ H02B *1/06*
U.S. Cl. 361—358 **2 Claims**

1. A circuit breaker panelboard assembly comprising:

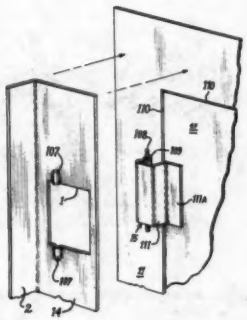
closure means housing at least one main circuit breaker or at least one main wire terminal lug and a plurality of branch circuit breakers;

access means movably arranged on said closure means providing access to said main and said branch circuit breakers from outside of said closure;

mounting means within said closure supporting said branch circuit breakers and providing electrical connection between said branch circuit breakers and electrical bus bars connectable with an external circuit; and

shield means intermediate said access means and said main and branch circuit breakers preventing contact with electrical terminals on said main and branch circuit breakers;

said access means comprising a metal or plastic face plate encompassing an opening defined through said face plate and a door arranged within said opening and supported



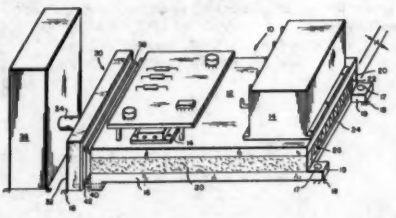
therein by at least one hinge, said hinge being formed from a single piece of metal having an L-shaped end and a cylindrical end, said L-shaped end being welded to said door and said cylindrical end encompassing a pin captured within a rabbet member, said rabbet member being welded to said face plate.

4,631,635

VIBRATION ISOLATED COLD PLATE ASSEMBLY

Richard T. Dolbeare, Millersville, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 31, 1984, Ser. No. 666,786
Int. Cl.⁴ H05K *7/20*
U.S. Cl. 361—383 **9 Claims**



1. A vibration isolated cold plate assembly comprising:

a base;

means made of a heat conducting material for supporting thereon at least one electronic component;

means interposed between said base and said supporting means for substantially preventing any vibration of said base from reaching said supporting means, said vibration preventing means defining an elongated channel between said base and said supporting means;

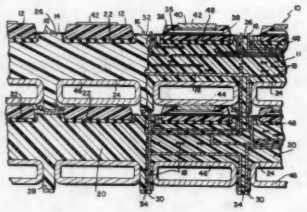
means located in said channel and secured only to said supporting means for conducting heat from said supporting means; and

means interconnected with said channel for supplying a coolant into said channel so as to flow in communication with said heat conducting means and said supporting means, said coolant supplying means including a flexible interconnecting seal directly connected to said base and said supporting means.

4,631,636
HIGH DENSITY PACKAGING TECHNIQUE FOR ELECTRONIC SYSTEMS

D. Marshall Andrews, Satellite Beach, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Mar. 26, 1984, Ser. No. 593,516
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—385 26 Claims



1. A high density packaging arrangement for electronics systems, comprising:

a first circuit board assembly, comprising an insulating circuit board having a plurality of electronic components mounted on a first side thereof and having conductor means interconnecting said electronic components, and having cooling means, mounted on a second side thereof, for passage of a coolant; and

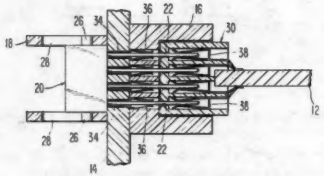
a second circuit board assembly, comprising an insulating circuit board having cooling means, mounted on a second side thereof, for passage of a coolant;

wherein said first and second circuit board assemblies are arranged such that said cooling means mounted on said second circuit board assembly is in heat conductive contact with at least one of said plurality of electronic components mounted on said first circuit board assembly.

4,631,637
DUAL BACKPLANE INTERCONNECT SYSTEM

Samuel R. Romania, Phoenixville, and Grant F. Steen, Bryn Athyn, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 23, 1985, Ser. No. 812,834
Int. Cl.[4] H01R 23/68
U.S. Cl. 361—413 6 Claims



1. A dual backplane interconnect system comprising in combination:

a pair of backplanes disposed in parallel, spaced-apart relation, each of said backplanes having at least a set of feed-through holes formed therein, the respective sets of feed-through holes of said pair of backplanes being homologously oriented with respect to each other,

a plurality of female feed-through sockets each having a plurality of electrical contacts, said feed-through sockets being affixed respectively to the interior opposing surfaces of said pair of backplanes, and overlying said sets of feed-through holes, said electrical contacts of said feed-through sockets being aligned respectively with said feed-through holes,

a plurality of pin header housings, each of said pin header housings being affixed to an exterior surface of one of said backplanes in direct positional relation to a corresponding feed-through socket,

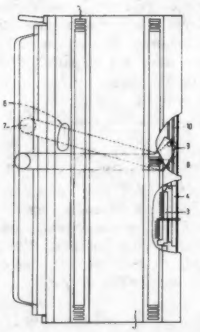
a plurality of pin headers each having a plurality of pins, each of said pin headers being movably disposed within a pin header housing, said pins being registered with said feed-through holes in said backplanes, said pins engaging said electrical contacts of said feed-through sockets via said feed-through holes, the extremities of said pins being retained within said feed-through sockets when said pin header is in a retracted position and being extended beyond said electrical contacts of said sockets when said pin header is in an extended position,

at least one logic board having female connectors at respective opposite extremities thereof, each of said female connectors having a plurality of electrical contacts, said retracted position of the pin headers permitting the unimpeded alignment of said electrical connectors with a pair of feed-through sockets on the respective backplanes, whereupon the movement of the pin headers to said extended position effects the engagement of said pins with the electrical contacts of said female connectors of said logic board.

4,631,638
BOX FOR HOLDING CIRCUIT BOARDS

Fritz Felsner, Leinburg, and Erich Geier, Stein, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 24, 1985, Ser. No. 738,200
Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419781
Int. Cl.[4] H05K 7/16
U.S. Cl. 361—415 4 Claims



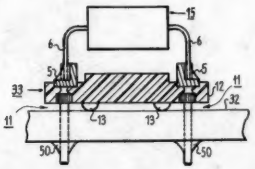
1. A box with a front and a back for holding circuit boards, said box having horizontal slots in a side wall which slots are arranged vertically one above the other, said box including a lever which is operable from the front of the box, said lever being disposed between a circuit board held in said box and said side wall, said lever including a fulcrum disposable in said horizontal slots for movement therein and an operating projection at the end of said lever at the back of said box for engaging a circuit board to aid in the removal thereof.

4,631,639

STUD AND A SUPPORT FOR FIXING AN ELECTRONIC COMPONENT TO A PRINTED CIRCUIT BOARD

Lucien Biraud, Fontenay-aux-Roses, France, assignor to Thomson CSF, Paris, France

Filed Apr. 26, 1984, Ser. No. 604,116
Claims priority, application France, Apr. 29, 1983, 83 07182
Int. Cl.[4] H05K 7/04
U.S. Cl. 361—417 10 Claims



5. A support arrangement for an electronic component comprising:

a plurality of support studs supporting an electronic component having a plurality of lugs, on a printed circuit board each of said studs including,

a pin electrically connecting one of said lugs of said electronic component to said printed circuit board,

means receiving one of said lugs, said receiving means including at least one abutment portion having an abutment face which by abutting said lug, positions said lug to said stud, the portion of said receiving means opposite said abutment portion being open to the extent that said lug has unhindered access to said abutment face and abuts said abutment portion on said abutment face and to the extent that solder can be withdrawn; and

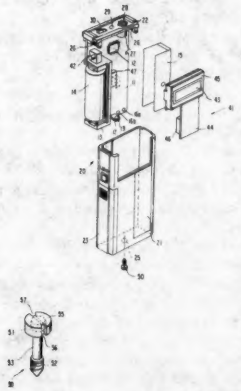
structural means supporting said support studs, with a portion of each of said support studs being fixed in said structural means.

4,631,640

PORTABLE RADIO DEVICE FOR PROTECTING A RADIO CIRCUIT FROM STATIC ELECTRICITY

Shinjiro Umetsu, and Takashi Oyamada, both of Tokyo, Japan, assignors to Nippon Electric Co. Ltd., Tokyo, Japan

Filed Aug. 19, 1985, Ser. No. 766,685
Claims priority, application Japan, Nov. 13, 1981, 56-181910
Int. Cl.[4] H05K 7/00
U.S. Cl. 361—422 5 Claims



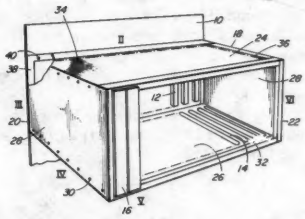
1. A portable radio device comprising: a printed wiring board having a first hole site which defines a tapped hole formed into said printed circuit board, a radio circuit mounted on said printed wiring board, an antenna, a housing of a non-conductive material encasing said printed wiring board together with said radio circuit and having a second hole site which defines a via hole formed through said housing and aligned with said tapped hole when said printed wiring board is encased in said housing, and a screw member fixing said printed wiring board in position to said housing, with said antenna brought into contact in said housing with said printed wiring board to be electrically connected to said radio circuit through said printed wiring board, said screw member having a metal machine screw portion having first and second ends with a threaded portion near said second end and engaged with said tapped hole; an axis extending between said first and second ends, and a head portion having a screw slot transverse to said axis on said first end; and an insulating cap enclosing said head portion so as not to expose said screw slot and having a groove along said axis.

4,631,641

ELECTRONIC APPARATUS WITH ELECTRO-MAGNETIC INTERFERENCE SCREENING

David S. Brombal, Dunrobin; Charles B. D. Bunner; Nickolas S. Gulis, both of Carp, and John P. Luszczek, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 18, 1985, Ser. No. 756,421
Int. Cl.[4] H05K 9/00
U.S. Cl. 361—424 14 Claims



1. Electronic apparatus comprising:

a backpanel including a plurality of connectors;

a plurality of circuit boards each connected via a connector to the backpanel at a back edge of the board and including at an opposite, front, edge of the board a faceplate comprising electrically conductive material;

an electrically conductive enclosure extending between the backpanel at a back edge of the enclosure and the faceplates at a front edge of the enclosure; and

electrically conductive means electrically interconnecting the faceplates around their peripheries with one another and with the enclosure at its front edge, adjacent faceplates being electrically interconnected by the electrically conductive means therebetween;

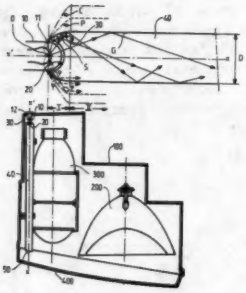
the backpanel including a ground conductor to which the enclosure is electrically connected around the periphery of its back edge.

4,631,642

ADAPTOR FOR COUPLING A LIGHT GUIDE TO A LIGHT SOURCE, IN PARTICULAR FOR PROVIDING AN INTEGRATED SIDE LIGHT IN A MOTOR VEHICLE HEADLAMP ASSEMBLY

Norbert Brun, Bobigny, France, assignor to Cible Projecteurs, France

Filed May 21, 1985, Ser. No. 736,460
Claims priority, application France, May 25, 1984, 84 08241
Int. Cl.[4] F21V 7/04
U.S. Cl. 362—32 9 Claims



1. A coupling adaptor for a cylindrical light guide, for coupling said guide with a substantially point light source located on the axis of and integral with the guide, said coupling adaptor being solid and homogeneous and comprising:

an inlet surface which is spherical and concave, which is centered on said point light source and which receives a portion thereof, whereby any light ray emitted by said source and striking said inlet surface passes through said inlet surface without deflection and penetrates inside the light guide; and

a light flux recovery surface which is convex and symmetrical about the axis of said light guide, said recovery surface being shaped in such a manner that the angle of incidence of a ray emitted by the source, passing through said inlet surface and striking said recovery surface is always greater than the limiting angle for total internal reflection appropriate to the refractive index of the material constituting the light guide;

whereby any light ray which passes through the inlet surface is totally reflected by the recovery surface and is captured by the light guide.

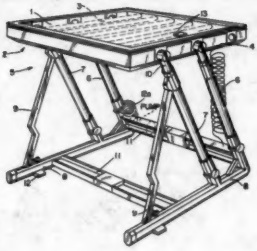
4,631,643

DEMOUNTABLE MULTI-PURPOSE LIGHT TABLE

Detlef Köster, c/o Progressive Design Service, 137 Bayswater Rd., Rushcutters Bay, Sydney, 2011, New South Wales, Australia

Filed Oct. 4, 1985, Ser. No. 784,208
Int. Cl.[4] G09F 13/04
U.S. Cl. 362—97 11 Claims

1. A storage case light table combination that includes a storage case, one or more work surfaces able to be housed in the storage case, and a support stand in which the storage case includes a light compartment, having an opening extending on at least one side, and adapted to pass light through the opening, one of the work surfaces is a light transmitting work surface that extends across, or can be releasably attached to extend across, the light compartment opening, and the support stand includes a pair of end support means able to be put in a closed configuration for storage in the storage case and in an open configuration for support of the work surface, and a stay means for maintaining the open configuration, each support means including at least one variable length telescopic leg so that the



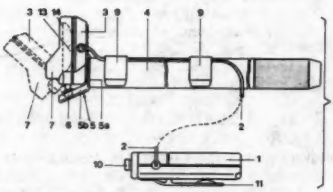
work surface can be put at an angle to the horizontal as required.

4,631,644

PORTABLE LAMP, ADAPTED TO BE WORN ON THE HEAD OF A USER

Günter Dannhauer, Grünwald, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft fur elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Jul. 3, 1985, Ser. No. 752,156
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1984, 3426358
Int. Cl.[4] A42B 1/24; F21L 15/14, 15/08
U.S. Cl. 362—105 8 Claims



1. A light-weight, vibration-resistant, head-mounted portable lamp and power source combination, particularly adapted for hands-free recreational and repair activities, comprising:

a housing (1) which can be disposed on the person of the user, remote from the head,

a low-voltage power source disposed in said housing;

a lamp unit (3) of light-weight materials including

a reflector (14) and

a low-voltage halogen incandescent light source (13);

a cable (2) interconnecting the housing and the lamp unit;

a universally adjustable carrying headband (4) capable of being secured around the head of a user and remaining so secured throughout any athletic activity by the user;

and means (5,6) providing a detachable mounting of the lamp unit (3) on the carrying band,

including

an angle element (5), having first (5*a*) and second (5*b*) portions disposed at angle with respect to each other, said first portion (5*a*) being separably attached to the carrying headband (4) and said second portion (5*b*) projecting slightly from the head of the user; and

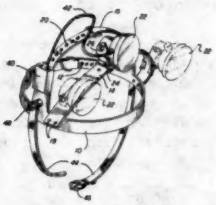
a single separable ball and socket joint (6) adjustably interconnecting the lamp unit (3) and said angle element (5), at least one of said ball and said socket being formed of elastically deformable material, one part of said ball-and-socket joint being formed in said second portion (5*b*) of said angle element,

said angle element being so dimensioned and said joint being so positioned thereon to permit pointing of said light source, selectively, horizontally directly ahead of the user, within a range of about 50° downwardly from the horizontal, rotated around the vertical axis, and any combination of the foregoing.

4,631,645
HEADLAMP ASSEMBLY

Stanley Lenart, Rte. 12, Alder Creek, N.Y. 13301

Filed Jun. 24, 1985, Ser. No. 747,796
Int. Cl.[4] F21L *15/14*
U.S. Cl. 362—105 **9 Claims**

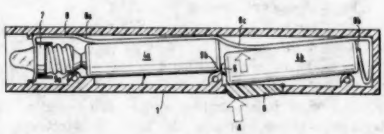


6. A headlamp assembly particularly for mechanics comprising in combination an adjustable head encircling headband; a first, unitary overhead strap connected at its opposite ends to the headband; a second, adjustable overhead strap connected at its opposite ends to the headband; the first and second overhead straps being disposed at an oblique angle to one another; a mounting member positioned on the first overhead strap for sliding movement therealong between its opposite ends; a lamp; means pivotally connecting the lamp to the mounting member whereby the lamp can be located at any point along the overhead strap and disposed in a position of desired angular adjustment; and an adjustable chin strap the ends of which are connected to the headband.

4,631,646
DISCARDABLE FLASHLIGHT

Hans Spindler, Remchingen-Singen, Fed. Rep. of Germany, assignor to Trautz & Co. Inh. Hans Spindler, Pforzheim, Fed. Rep. of Germany

Filed Feb. 18, 1986, Ser. No. 831,134
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 8505037[U]
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—118 **11 Claims**

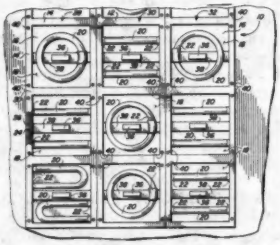


1. In a discardable flashlight comprising
a housing having forward and rear ends,
a lampholder assembly mounted in said housing at said forward end,
two batteries, which are stacked in said housing, and
manually operable control means for connecting said batteries in circuit with said lampholder assembly,
the improvement residing in that
each of said batteries has a forward portion and a rear portion,
said forward portion of said forward battery is in electric contact with said lampholder assembly,
said forward portion of said rear battery is laterally movable in said housing between a make position, in which said forward portion of said rear battery is in electric contact with said rear portion of said forward battery, and a break position, in which said electric contact is eliminated,
conducting means are provided, which are arranged to connect said batteries in series with each other and with said lampholder assembly when said forward portion of said rear battery is in said make position, spring means are contained in said housing and bear on one side of said forward portion of said rear battery and urge said forward portion of said rear battery toward said break position, and
said control means comprises a fingerpiece, which is carried by said housing and accessible from the outside and bears on said forward portion of said rear battery, on the side which is opposite to said spring means, and
said fingerpiece is manually depressible to move said forward portion of said rear battery from said break position to said make position against the force of said spring means.

4,631,647
WALL AND CEILING LIGHT DEVICE

Robert Ranney, Star Rte. 3 - Box 4950-31, Tehachapi, Calif. 93561

Filed Feb. 24, 1986, Ser. No. 831,859
Int. Cl.[4] F21S *1/02*
U.S. Cl. 362—147 **10 Claims**

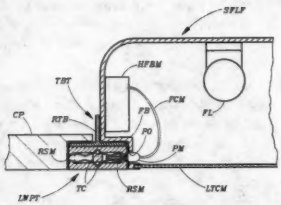


1. An improved interior wall and ceiling light device, said device comprising, in combination:
(a) a rigid, generally flat rear grid bearing electrical wiring, including means for connecting to an external power source, and also including spaced electrical outlets;
(b) a plurality of electrical lights releasably electrically connected to said spaced outlets;
(c) connector means for releasably connecting said grid to a building wall and a building ceiling;
(d) a plurality of flat translucent panels bearing beveled outer edges; and,
(e) a plurality of spacer legs releasably spacing each of said panels in front of said grid and generally parallel thereto and releasably interconnecting said panels to said grid, said legs also releasably retaining said panels in abutting edge to edge relation to form a continuous translucent sheet, wherein said panels can be easily pulled away from adjacent panels and said grid for easy access to those electrical lights adjacent thereto, said light device when in operation providing a continuous wall of light of uniform illumination.

4,631,648
MODULAR SUSPENDED CEILING AND LIGHTING SYSTEM

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Jul. 9, 1984, Ser. No. 629,221
Int. Cl.[4] F21S *1/14*
U.S. Cl. 362—150 29 Claims



1. A lighting system for a suspended ceiling, said suspended ceiling being suspended some distance below a permanent ceiling by way of a suspended grid with grid members and grid openings, said grid openings being covered by removable cover means thereby forming an enclosed air space between the two ceilings, the enclosed air space being useful as an air plenum, said cover means comprising ceiling panels and electric lighting means, said lighting system comprising:

a voltage source;

power track means attached to said suspended grid, said power track means having receptacle means and track conductors connected with said voltage source, said receptacle means being: i) operable to receive and hold electric plug means, and ii) accessible only from outside of said enclosed air space; and

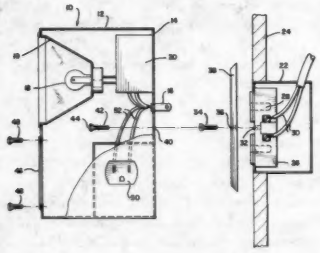
said lighting means being adapted to be powered from said voltage source by way of electric input means accessible only from outside of said air space, said input means having electric plug means adapted for plug-in insertion into said receptacle means;

such that disconnectable electrical connection is made between said voltage source and said lighting means while obviating the need for having electrical conductor means traversing said enclosed air space.

4,631,649
PLUG-IN EMERGENCY LIGHT FIXTURE

Robert J. McCue, and Ronald H. Minter, both of Guilford, Conn., assignors to Chloride Systems, a division of Chloride Power Electronics, Incorporated, El Paso, Tex.

Filed Oct. 16, 1985, Ser. No. 788,033
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—183 4 Claims



1. An emergency light fixture permanently mountable in a conventional power outlet box having in fixed relation a threaded bore for accommodating a screw for a face plate and slots for accommodating an electric plug, the emergency light fixture comprising:

a housing;

an electric plug extending from the rear wall of the housing;

a battery mounted in the housing;

a lamp mounted in the housing and connected to the battery for illumination during a power outage;

charging means connected to the electric plug and the battery for charging the battery;

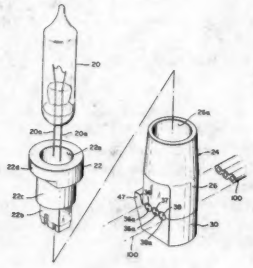
a tamperproof screw for permanently attaching the housing to the outlet box having a tamperproof engaging means for engagement with a complementary portion of a screwdriver for tamperproof screws and for preventing engagement with conventional slotted or phillips head screwdrivers; and

aperture means in the rear wall of the housing for accommodating the screw for permanently attaching the housing to the outlet box, the aperture means being in fixed relationship with the electric plug so that the aperture means is aligned with the threaded bore in the outlet box when the electric plug is aligned with the slots in the outlet box.

4,631,650
SERIES-PARALLEL CONNECTED MINIATURE LIGHT SET

Joseph M. Ahroni, 2701 W. Manor Pl., #204, Seattle, Wash. 98199

Filed Oct. 24, 1984, Ser. No. 664,153
Int. Cl.[4] F21V *19/00*
U.S. Cl. 362—249 21 Claims



1. A lighting string comprising:

a plurality of series of lampholders with lights and wireways;

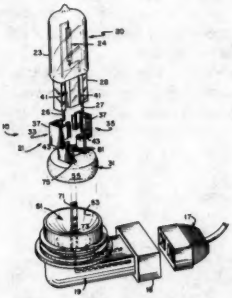
a cord passing through the wireway of each of said lampholders, said cord having three wires separated by insulation and having a respective cutout entirely within the wireway of each lampholder and severing one of said wires, said cutouts being shorter than the wireways, the other two wires being non-severed at the lampholders; and

respective contact means in the lampholders piercing the cord insulation and engaging the severed wire, said contact means bridging said cutouts in the severed wire via the lights, the contact means of the first lampholder in each of said series also piercing said cord insulation and making electrical contact with one of the non-severed wires, and the contact means of the last lampholder in each of said series also piercing said cord insulation and making electrical contact with the other of the non-severed wires, whereby said plurality of series of lampholders are connected in parallel.

4,631,651
REPLACEABLE AUTOMOBILE HEADLIGHT LAMP UNIT AND AUTOMOBILE HEADLIGHT UTILIZING SAME

John A. Bergin, Hancock, and Frank Cangiano, Hillsboro, both of N.H., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 10, 1985, Ser. No. 743,122
Int. Cl.[4] F21V *29/00*
U.S. Cl. 362—267 18 Claims



1. A lamp unit for being removably positioned within an opening within the rear of an automobile headlight reflector, said lamp unit comprising:

an electrically insulative holder for being positioned within said opening, said holder defining a cavity therein having at least one curved surface;

an electric lamp adapted for being securedly retained in a predetermined orientation relative to said holder, said lamp including an envelope having a filament structure therein adapted for being positioned within said reflector when said holder is positioned within said opening of said reflector and at least two lead-in wires projecting from said envelope; and

a clamp member including an electrically insulative base positioned within said cavity of said holder and fixedly secured thereto, and a pair of electrically conductive clips spacedly positioned within said base and secured about said envelope of said lamp, each of said lead-in wires being connected to a respective one of said clips at a precise depth location relative to said filament structure, said base including at least one external surface of a curvature substantially similar to said curved surface of said cavity of said holder and engaging said curved surface, said base and cavity orientation enabling said electric lamp to be both rotatably and pivotally oriented within said cavity of said holder prior to said fixed securement of said base to said holder to precisely position said filament structure within said lamp envelope relative to a surface of said holder.

4,631,652
FREQUENCY CONTROLLED RESONANT REGULATOR

Frank S. Wendt, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 30, 1984, Ser. No. 676,821
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—16 9 Claims

1. A frequency controlled resonant regulator comprising:

a source of unregulated voltage;

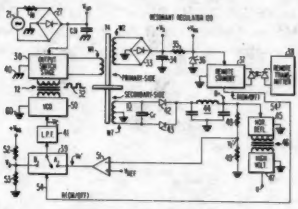
a power transformer having a first winding coupled to said source;

output switching means coupled to said first winding;

a controllable source of switching signals coupled to said output switching means for operating said switching means at a controllable frequency to generate a first alternating output voltage across a second winding of said power transformer to power a first load circuit, said transformer incorporating high leakage inductance between said first and second windings;

a resonanting capacitance coupled to said second winding for forming a tuned circuit with the leakage inductance of said transformer to establish the amplitude of said output voltage in accordance with said controllable frequency;

means coupled to said controllable source and responsive to a sense signal for developing a control signal that varies said controllable frequency in accordance with said sense signal to regulate said first altnerating output voltage;



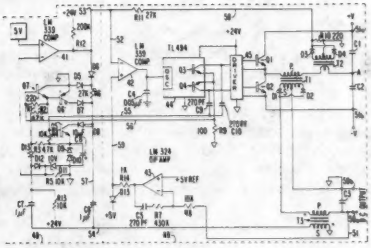
a third winding of said transformer tightly coupled with said first winding and loosely coupled with said second winding for generating a second alternating output voltage having an amplitude that is generally unaffected by substantial changes in the operating point of said tuned circuit; and

a DC power supply responsive to said second alternating output voltage for generating a DC voltage having an amplitude that is generally unaffected by substantial changes in the operating point of said tuned circuit and that is available for powering a second load circuit when said operating point is outside the normal regulation range.

4,631,653
CAPACITOR COUPLED CURRENT MODE BALANCE CIRCUIT

Kenneth T. Small, Cupertino, Calif., assignor to Boschert Incorporated, Milpitas, Calif.

Filed May 25, 1984, Ser. No. 614,420
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—17 12 Claims



1. A power supply comprising:

a first switch;

a second switch;

an output terminal;

a transformer having a secondary winding coupled to said output terminal and a primary winding, said primary winding having a first lead coupled to said first and second switches, said primary winding having a second lead;

a first capacitor coupled to said second lead;

a second capacitor coupled to said second lead;

means for closing said first switch, then opening said first switch, then closing said second switch, and then opening said second switch, current flowing through said primary winding in a first direction when said first switch is closed, current flowing through said primary winding in a second direction when said second switch is closed; and

means for sensing the voltage across said first and second capacitors and reducing any inequality between the times said first and second switches are closed by an amount of time dependent on the magnitude of said sensed voltage.

4,631,654

TWO-STATE SWITCHED-MODE POWER SUPPLY

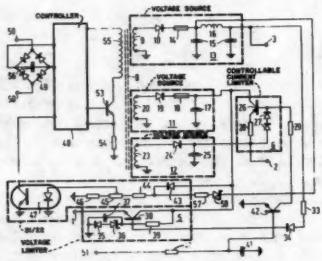
Yves L. P. Honee, Nanterre, and Pierre Vacher, Suresnes, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 7, 1983, Ser. No. 549,116

Claims priority, application France, Dec. 10, 1982, 82 20742

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—21 **7 Claims**



1. A switched-mode power supply capable of operating optionally in two states, comprising at least two controllable voltage sources having respective control inputs, at least two power supply output terminals and first regulating means coupled to the control input on each of said voltage sources for supplying a signal which acts, on the switching operation, to reduce the values of the voltages supplied by all of the voltage sources when one voltage exceeds a first reference value, characterized in that said switched-mode power supply further comprises second regulating means also coupled to said control inputs for supplying a signal which acts, on the switching operation, to reduce the values of the voltages supplied by all the voltage sources when a voltage exceeds a second reference voltage,

first change-over elements for selectively connecting an output of one of the voltage sources to the first regulating means in a first state or to the second regulating means in a second state,

second change-over elements for selectively connecting one of said output terminals to one voltage source in the first state or to the other voltage source in the second state,

and a device which simultaneously controls the first and second change-over elements for selecting the desired state.

4,631,655

POWER DISTRIBUTION SYSTEM

Hendrik van Husen, Glen Ellyn, Ill., assignor to GTE Communication Systems Corp., Northlake, Ill.

Filed Dec. 24, 1984, Ser. No. 685,655

Int. Cl.[4] H02H *7/10*

U.S. Cl. 363—50 **23 Claims**

1. A power distribution system for use in an electronic system that includes a load bus, a load connected to said load bus, and a direct current power source which is operative to provide power of a first characteristic, said power distribution system comprising:

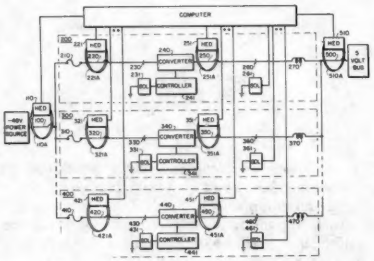
an input power monitoring circuit connected to said power source;

a plurality of power conversion circuits that are connected to said input power monitoring circuit;

said input power monitoring circuit being operative to monitor current flow from said power source to said power conversion circuit and to provide a plurality of power input status signals, each associated with a different one of said power conversion circuits;

each of said power conversion circuits being operative to convert said power of a first characteristic to power of a different characteristic;

an output power monitor and control circuit that is connected between said plurality of power conversion circuits and said load bus, and is operative both to monitor current flow from said power conversion circuits and to



provide a plurality of power output status signals, each associated whit a different one of said power conversion circuits; and

a power comparison circuit that is connected to said plurality of power conversion circuits and is operative both to compare said power input and output status signals to predetermined values therefor, and to provide a failure signal for each status signal that does not correspond to its predetermined value;

said output power monitor and control circuit comprising a plurality of current controlling inductors, each being connected between said load bus and an associated one of said power conversion circuits, each of said current controlling inductors being effective to restrict current flow from said load bus into said associated power conversion circuit to a predetermined level and for a predetermined time which is greater than the time required for said output power monitor and control circuit to disconnect said associated power conversion circuit from said load bus.

4,631,656

MOUNTING FOR ELECTRICAL CONVERTER VALVE ASSEMBLY

Karl-Erik Olsson, Ludvika, Sweden, assignor to Asea Aktiebolag, Västerås, Sweden

Filed Jun. 15, 1984, Ser. No. 621,286

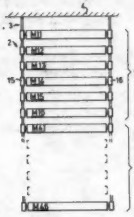
Claims priority, application Sweden, Jun. 16, 1983, 8303459

Int. Cl.[4] H02M *7/757*

U.S. Cl. 363—123 **14 Claims**

1. A static electrical converter, particularly for high voltage DC, including at least one valve assembly with one or more valves electrically connected in series, each of said valves having a plurality of valve modules carried in a carrier means included in the valve assembly and adapted to be dependently mounted, wherein the valve modules are suspended under each other and are each connected to the carrier means by resilient

members allowing relative vertical movement between the valve modules and between the valve modules and an upper



part of the carrier means, said upper part being adapted to be suspended from a carrier structure.

4,631,657

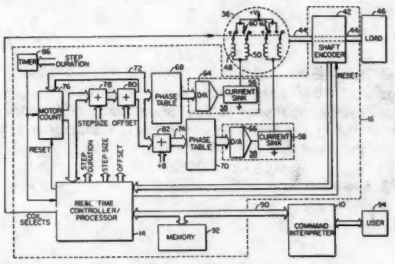
CONTROL AND FORCE-SENSING METHOD AND APPARATUS FOR MOTORS

John W. Hill, Palo Alto, and Anthony J. Sword, San Francisco, both of Calif., assignors to Microbot, Inc., Mountain View, Calif.

Division of Ser. No. 426,631, Sep. 29, 1982, Pat. No. 4,535,405. This application May 1, 1985, Ser. No. 729,475

Int. Cl.[4] G06F *15/46*; G05B *19/40*

U.S. Cl. 364—167 **24 Claims**



16. An apparatus responsive to a set of drive instructions for controlling the rotation of a shaft of a stepper motor in a number of predetermined modes, wherein the stepper motor is responsive to a drive waveform having a sequence of stair steps and is capable of rotation at a rotational velocity which is selected from a range of velocities, the apparatus comprising

means responsive to a set of drive instructions for generating a sequence of step size and step duration data which are a function of a selected rotational velocity, wherein the step size and step duration data respectively designate relative amplitude and relative duration magnitudes and are generated as a function of the particular mode designated by the drive instructions; and

means responsive to the sequence of step size and step duration data for generating the sequence of stair steps, whereby the duration of each stair step in the drive waveform is determined by the step duration data.

4,631,658

METHOD OF AND APPARATUS FOR CONTROLLING A DOMESTIC APPLIANCE

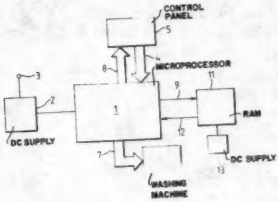
Stephen P. Easthill, Chessington, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 3, 1984, Ser. No. 637,662

Claims priority, application United Kingdom, Aug. 17, 1983, 8322169

Int. Cl.[4] G06F *15/46, 11/00*

U.S. Cl. 364—184 **8 Claims**



5. A domestic appliance, operable from an electric mains supply, comprising control means including a solid state processor which controls the appliance by selecting an optionally variable number of operating steps from N such steps, held in the processor, in accordance with any one of a number of programmes selectable by the user, the control means further including a non-volatile memory containing a corruption test code, information identifying a selected programme, and respective data at each of N addresses which defines whether or not a particular step corresponding to that address was processed during the running of the last previous programme, start-up means solely operative before the processor effects any operating step to check the test code for corruption and to examine the data at each of the N addresses in the memory in sequence, the processor having means for reading the memory and starting the operation of the appliance either from the first selected one of the N operating steps or, if the data at any of the N addresses in the memory indicates that a particular operating step was not crossed during the last previous run, starting the operation of the appliance from the first operating step in the sequence that was not so processed.

4,631,659

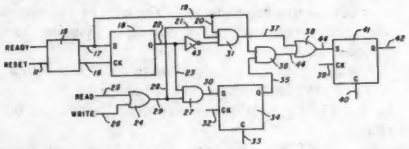
MEMORY INTERFACE WITH AUTOMATIC DELAY STATE

John Hayn, II, Midland, and John Schabowski, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 587,335, Mar. 8, 1984, abandoned. This application Apr. 1, 1985, Ser. No. 718,584

Int. Cl.[4] G06F *13/38*

U.S. Cl. 364—200 **5 Claims**



1. In a digital processing system including a processor with an internal clock and an external memory, a memory interface connected between the processor and external memory, the memory interface comprising:

an information transfer bus operably connected between the processor and the external memory for transferring of

information between the processor and the external memory;

control means connected to the information transfer bus and the processor for generating at least one control signal for synchronously controlling the transfer of information on the information bus by controlling the time at which the processor reads information from the external memory;

flip-flop means having a first logic state and a second logic state for selecting whether to time delay the control signal; and

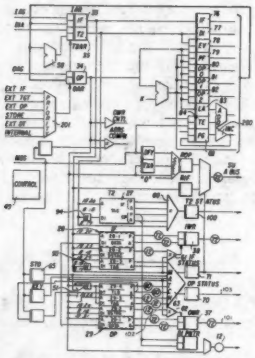
wait circuit connected to said control means and said flip flop means for delaying the control signal by a first time delay when the flip flop means is at the first logic state.

4,631,660

ADDRESSING SYSTEM FOR AN ASSOCIATIVE CACHE MEMORY

Gary A. Woffinden, Scotts Valley; Gene M. Amdahl, Atherton, and Donald L. Hanson, Los Altos Hills, all of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Aug. 30, 1983, Ser. No. 527,674
Int. Cl.[4] G06F *12/08*
U.S. Cl. 364—200 **8 Claims**



1. A memory system comprising:

a main store for storing lines of data;

a buffer store, accessed by a requesting address, for storing lines of data that are a sub-set of the lines of data stored in said main store, said buffer having a first and second associativity;

said first associativity having a line of data from a first address in said buffer store and said second associativity having a line of data from a second address in said buffer store;

pointer means for storing a data select pointer that indicates a bit location within said first and second addresses which has a first value in said first address at said bit location and a second value in said second address at said bit location; and

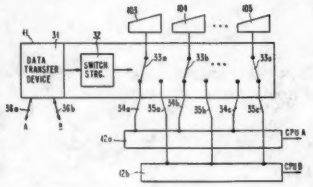
data selection means for receiving said data select pointer to access said bit location in said requesting address to select between said first and second associativities.

4,631,661

FAIL-SAFE DATA PROCESSING SYSTEM

Wolfgang Eibach, Holzgerlingen; Kuno M. Roehr, Boeblingen, and Klaus M. Schulz, Aidlingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 545,285, Oct. 25, 1983, abandoned.
This application Mar. 19, 1986, Ser. No. 850,425
Claims priority, application European Pat. Off., Dec. 7, 1982, 82111312.3
Int. Cl.[4] G06F *11/16*
U.S. Cl. 364—200 **11 Claims**



1. A fail-safe data processing system including:

a plurality of processors;

a plurality of switching units connected in series and star-connected to said plurality of processors, said plurality of switching units being addressable by each of said plurality of processors; and

a plurality of peripheral units coupled to said plurality of switching units, said plurality of peripheral units thereby being connected to any of said plurality of processors

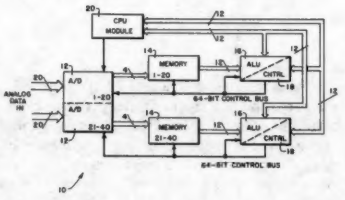
whereby said fail-safe data processing system can continue operating even upon the failure of one of said plurality of processors because the peripheral units connected to the failed processor are switched to an operable processor by said plurality of switching units.

4,631,662

SCANNING ALARM ELECTRONIC PROCESSOR

Richard A. Stutler, King George, Va., and Jeffrey T. Harris, Palm Bay, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 5, 1984, Ser. No. 628,093
Int. Cl.[4] G06F *9/38*
U.S. Cl. 364—200 **5 Claims**



1. A scanning alarm electronic processor (SAEP) for receiving and evaluating a predetermined number of analog signals, said SAEP being physically divided into two sections each section being configured to process halve of the predetermined number of analog signals, said SAEP comprising:

a plurality of first section analog-to-digital (A/D) modules operatively connected at their inputs to half of the predetermined number of analog signals;

a plurality of first section memory modules operatively

connected to corresponding ones of said plurality of first section A/D modules;

a plurality of first section arithmetic logic unit (ALU) modules operatively connected to corresponding ones of said plurality of first section memory modules;

a plurality of first section control modules operatively connected to corresponding ones of said plurality of first section ALU modules, memory modules, and A/D modules;

a plurality of second section A/D modules operatively connected at their inputs to the other half of the predetermined number of analog signals;

a plurality of second section memory modules operatively connected to corresponding ones of said plurality second section of A/D modules;

a plurality of second section ALU modules operatively connected to corresponding ones of said plurality of second section memory modules;

a plurality of second section control modules operatively connected to corresponding ones of said plurality of second section ALU modules, memory modules, and A/D modules;

said pluralities of first and second section analog-to-digital modules, memory modules, arithmetic logic units and control modules being connected to their respective preceeding input devices and succeeding output devices in pipeline fashion, and

a common central processor unit (CPU) module operatively connected to both of said first and second section plurality of control modules, and operatively connected to both of said first and second section plurality of A/D modules, and ALU modules so as to coordinate the first and second sections together in a parallel pipeline fashion to increase the processing speed.

4,631,663
MACROINSTRUCTION EXECUTION IN A MICROPROGRAM-CONTROLLED PROCESSOR

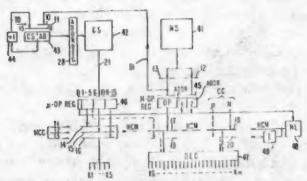
Herbert Chilinski; Klaus J. Getzlaff, both of Schoenaich; Johann Hajdu, and Franz J. Raeth, both of Boeblingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 2, 1983, Ser. No. 500,583

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1982, 82105015[U]

Int. Cl.⁴ G06F *9/22, 9/40*

U.S. Cl. 364—200 **7 Claims**



1. In a microprogram-controlled processor which carries out macroinstructions by either execution of a series of microinstructions which are routed to the operation decoder or by direct routing of said macroinstruction to said operation decoder from the macroinstruction operation register, comprising:

a control storage for storing a hardware control word which controls said direct routing of a macroinstruction, said hardware control word comprising a mode control bit and a plurality of direct control bits;

a microinstruction operation register connected to said control storage for reading said hardware control word from said control storage and for generating control signals from said plurality of direct control bits contained in said hardware control word;

first gating means coupled to said microinstruction operation register for outputting said generated control signals; and

second gating means coupled to said macroinstruction operation register for directly routing said macroinstruction to said operation decoder;

a mode latch connected to said microinstruction operation register, said mode latch being activated by said mode control bit having a preselected value indicating that a macroinstruction is to be directly routed to said operation decoder, said mode latch controlling said first and second gating means, whereby the execution of said macroinstruction is controlled by said control signals.

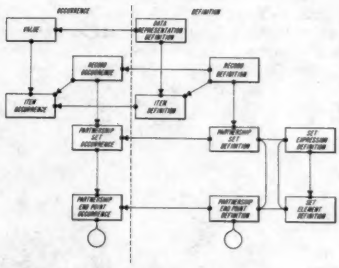
4,631,664
PARTNERSHIP DATA BASE MANAGEMENT SYSTEM AND METHOD

Charles W. Bachman, Lexington, Mass., assignor to Bachman Information Systems, Inc., Cambridge, Mass.

Filed Jul. 19, 1983, Ser. No. 515,290

Int. Cl.⁴ G06E *7/00*

U.S. Cl. 364—200 **10 Claims**



1. A data base management system for controlling storage, retrieval and modification of information in a data collection contained in storage devices in a data processing system, said data collection consisting of a plurality of data records, each data record including zero, one or more items, each item being representative of zero, one or more data values, comprising:

A. means for establishing in said data processing system one or more partnership sets within at least one data record, each of said partnership sets being representative of zero, one or more partnerships,

B. means for establishing in said data processing system one or more of said partnerships, wherein each of said partnerships is characterized by one partnership set associated with itself or associated with one other partnership set,

C. means for accessing in said data processing system one or more data records by reference to a partnership set which is in partnership with partnership sets of said one or more data records.

4,631,665
MICROPROCESSOR HAVING A PROGRAMMABLE LOGIC ARRAY

Hiroshi Yokouchi, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1983, Ser. No. 482,169

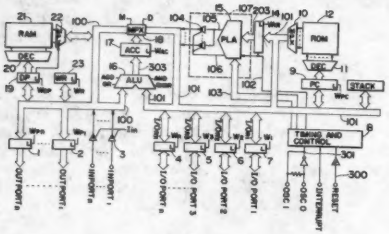
Claims priority, application Japan, Apr. 14, 1982, 57-60876

Int. Cl.⁴ G06F *13/38*

U.S. Cl. 364—200 **4 Claims**

1. A microprocessor comprising: a program counter for designating instruction data, a data bus line, a timing and control circuit for outputting an internal reset signal in response to an external reset signal, a programmable logic array for output-

ting a reset data signal and a reset data bus control signal by interpreting said internal reset signal as an instruction, and a



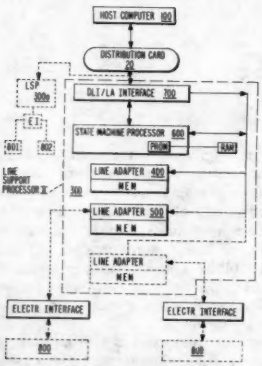
gate circuit means for inputting said reset data signal into said data bus line in response to said reset data bus control signal so as to reset said program counter.

4,631,666

DATA TRANSFER NETWORK FOR VARIABLE PROTOCOL MANAGEMENT

Craig W. Harris, El Toro; Lyle O. Jevons, Jr., Mission Viejo, and Richard A. Loskorn, Dana Point, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 25, 1982, Ser. No. 436,710
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **5 Claims**



1. A data transfer network for data transfers between a main host computer and a plurality of remote data sets operating under different protocol and timing disciplines wherein said main host computer initiates I/O data transfer commands to a line support processor means having a plurality of line support processors, each one of which manages data transfers between one of said remote data sets and said main host computer, said data transfer network comprising:

(a) said main host computer connected to each one of said line support processors and including:

(a1) main memory means for storing data to be transmitted to/received from said remote data sets and including:

(a1a) a first dedicated memory area for storing a I/O data transfer commands for transmittal to said line support processors;

(a1b) a second dedicated memory area for storing operational codes for transmittal to said line support processors wherein said operational codes contain information translatable, by said line support processor, into control data for selecting timing and protocol discipline for a selected line adapter;

(a2) a main processor for selecting said I/O data transfer commands and said operational codes for communication and control of said line support processor, said processor including:

(a2a) connection means to a distribution control circuit;

(b) a base module providing backplane connection means for slide-in circuitry cards, said base module including:

(b1) said distribution control circuit functioning to connect and/or disconnect said host computer to/from a selected line support processor in line support processor means;

(b2) said line support processor means functioning to execute said I/O data transfer commands by controlling a selected line adapter to a remote data set, said line support processor means including:

(b2a) a plurality of line support processors connected to said distribution control circuit wherein each said line support processor includes:

(B2a1) interface circuit means connecting said main host computer, via said distribution control circuit, to a plurality of line adapter means and to a state machine processor means;

(b2a2) said state machine processor means including a state machine processor operating to translate said operational codes into control data for operating a selected line adapter in a desired timing and protocol discipline for managing data transfers between said selected line adapter and an associated said data set, said state machine processor means including:

(i) a first auxiliary memory storage area for receiving said operational codes from said host computer;

(ii) program memory means for enabling said state machine processor to translate said operation codes into control data for operating a selected line adapter;

(iii) said state machine processor operating to transmit said control data to said selected line adapter for selecting and managing the timing and protocol discipline for data transfers, and including:

(ie) means for selecting a particular line adapter in said plurality of line adapter means;

(iie) means for identifying the required timing and protocol discipline for said particular line adapter;

(iiie) means for generating address signals for selecting a desired control register in said particular line adapter and placing said control data therein;

(ive) means for transferring data to/from said particular line adapter;

(ve) means for selecting a group of multiplexors associated with said selected particular line adapter;

(c) said plurality of line adapter means connected to said state machine processor means and including a plurality of line adapters, wherein each line adapter includes:

(c1) a data communication line to an associated said remote data set;

(c2) a plurality of control registers holding said control data for managing data transfers according to a desired timing and protocol discipline, said control data being derived from said state machine processor means;

(d) transceiver-controller means, operating under control of said state machine processor means, for switching a data bus to connect said state machine processor to a selected line adapter or to connect said selected line adapter to a multiplexor means;

(e) said data bus connecting each of said line adapters to said transceiver-controller means;

(f) multiplexor means including:

(f1) a plurality of groups of multiplexors whereby each group of multiplexors is connected to an associated line adapter for conveying bytes of data from said remote data set to said state machine processor means for subsequent transfer to said host computer, and wherein each said group of multiplexors includes:

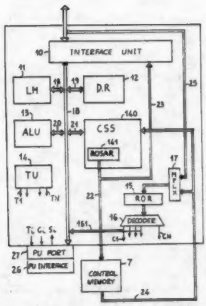
(f1a) coded input signal means for identifying the particular timing and protocol discipline required for the said associated line adapter.

4,631,667

ASYNCHRONOUS BUS MULTIPROCESSOR SYSTEM

Ferruccio Zulian, Cornaredo, and Vittorio Zanchi, Milan, both of Italy, assignors to Honeywell Information Systems Italia, Milan, Italy

Filed Jun. 27, 1983, Ser. No. 507,854
Claims priority, application Italy, Jul. 6, 1982, 22248 A/82
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **6 Claims**



1. An improved asynchronous bus multiprocessor system of the type in which a plurality of processors communicate with a working memory through a common system bus wherein each processor comprises:

a first bus interface register for the latching of working memory address/commands through an internal bus,

a second bus interface register for the latching of information read out from working memory through the internal bus,

a microprogrammed control unit comprising: a microprogram memory, a microprogram memory address register having outputs connected to address inputs of said microprogram memory, a microinstruction register for the latching of a microinstruction read out from said microprogram memory, a first loading path from the output of said microprogram memory to the input of said microinstruction register, a decoder for microcommand generation from said microinstruction and a timing unit, wherein the improvement consists in that at least one said processor comprises:

a third bus interface register the output of which is coupled to the system bus via the internal bus for the latching of working memory address/commands, having inputs connected to the outputs of said microprogram memory address register;

a second loading path for said microinstruction register from said working memory through said system bus to the input of said microinstruction register;

gate means inserted on said first and second paths to control information flow on said paths;

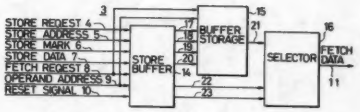
a logical sequencing network which, clocked by said timing unit, when enabled by an information identifying a microinstruction addressed by said microprogram memory address register as stored in working memory, generates a sequence of microcommands, said microcommands controlling the accesss to said working memory by inhibiting said first and second interface registers and controlling said gate means to inhibit said first loading path and further enabling said third interface register and said second loading path.

4,631,668

STORAGE SYSTEM USING COMPARISON AND MERGER OF ENCACHED DATA AND UPDATE DATA AT BUFFER TO CACHE TO MAINTAIN DATA INTEGRITY

Kanji Kubo, and Chikahiko Izumi, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 21, 1983, Ser. No. 460,018
Claims priority, application Japan, Feb. 3, 1982, 57-14964
Int. Cl.[4] G06F *13/00/13/18, 13/12*
U.S. Cl. 364—200 **3 Claims**



1. A storage system comprising:

main storage means for storing data;

cache storage means coupled to said main storage means for storing a portion of the data stored in said main storage means, said cache storage means operating to store data in response to receipt of a write pulse and a store address and to read out data in response to receipt of a fetch request and a fetch address;

request generating means for generating a fetch address together with a fetch request when data is to be fetched from said cache storage means, and for generating a store address, store data and a store mark together with a store request when data is to be stored in said storage means, said store mark identifying that portion of the store data to be stored in said cache storage means; and

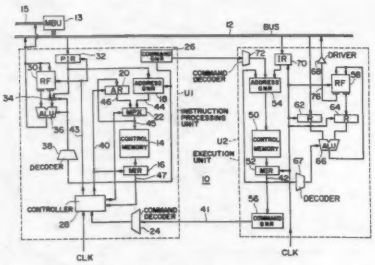
store buffer means coupled to said cache storage means and said request generating means for temporarily storing data before it is stored in said cache storage means, including a plurality of register means for storing the store address, store data and store mark from said request generating means into one of said register means in response to receipt of the store request for said request generating means input control means for specifying in regular order the register means to store the store address, store data and store mark accompanied by the store request, in response to said store request, means for transferring said store address, store data and store mark stored in said register means to said cache storage means along with a write pulse at a time when no fetch request is being generated by said request generating means, output control means for specifying in regular order the register means storing the store address, store data and store mark to be transferred to said cache storage means, comparison means for comparing the fetch address accompanied by the fetch request from said request generating means and the store addresses stored in the respective register means, and for providing coincidence signals indicating coincidence between said addresses, and output means responsive to the coincidence signal from the comparison means for controlling said transferring means to output the store data and store mark from the register means which said comparison means indicates has provided said coincidence; and

means for merging the data read from said cache storage means in response to the fetch request and the portion of said store data outputted under control of said output means and identified by said store mark outputted from said store buffer means.

4,631,669
DATA PROCESSING SYSTEM HAVING NO BUS UTILIZATION PRIORITY CONTROL

Akinori Horikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 9, 1984, Ser. No. 597,964
Claims priority, application Japan, Apr. 7, 1983, 58-61148
Int. Cl.[4] G06F *13/36*
U.S. Cl. 364—200 **2 Claims**



1. A data processing system having no bus utilization priority control, comprising:

an instruction processing unit operating in accordance with a plurality of first microinstructions prestored therein;

an execution unit which operates in accordance with a plurality of second microinstructions prestored therein and which operates synchronously with said instruction processing unit; and

a bus operatively connected with said instruction processing unit and said execution unit;

said execution unit generating a pause command when said execution unit uses said bus during the next microinstruction cycle of said second microinstructions;

said instruction processing unit being supplied with said pause command, and including a circuit which causes double occurrences of one of said first microinstructions in response to said pause command in the event that said instruction processing unit uses said bus during the next microinstruction cycle of said second microinstructions, said instruction processing unit further including an instruction processing portion which is arranged to temporarily disable the first microinstruction of said double occurrences in response to said pause command;

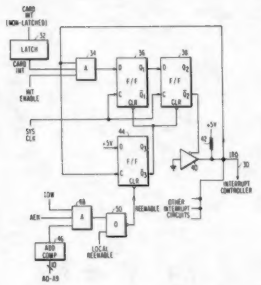
said instruction processing unit comprising:

a first control memory for previously storing said first microinstructions, a first control memory address generator for generating address signals for deriving microinstructions from said first microinstructions within said first control memory, a first address register, a multiplexer for selectively allowing either said first control memory address generator or said first address register to couple with said first control memory, said multiplexer normally coupling said first control memory address generator with said first control memory, said first address register receiving the output of said multiplexer and updating the content thereof, a first microinstruction register for storing each microinstruction derived from said first control memory, said first microinstruction register communicating the content thereof back to said first control memory address generator, and a controller receiving the content of said first microinstruction register, said controller, in response to said pause command, allowing said multiplexer to couple said first address register with said first control memory in order to cause said double occurrences of said first microinstructions and at the same time disabling said insturction processing portion in case said instruction processing unit uses said bus during the next microinstruction cycle of said processing unit.

4,631,670
INTERRUPT LEVEL SHARING

David J. Bradley, Boca Raton, and William B. Ott, Lake Worth, both of Fla., assignors to IBM Corporation, Armonk, N.Y.

Filed Jul. 11, 1984, Ser. No. 629,868
Int. Cl.[4] G06F *9/46*
U.S. Cl. 364—200 **11 Claims**



1. In an interrupt system having an interconnection for an external interrupt signal, a shared interrupt interface circuit for permitting sharing of interrupt levels, comprising:

pulse generating means for impressing on said interconnection a pulse transition to a first level from a second level, said interconnection being held at said first level if any such pulse generating means is impressing a first level on said interconnection;

interrupt state means having an interrupt state and a noninterrupt state in response to an internal interrupt signal generated by a device requesting an interrupt, said state means causing said pulse generating means to generate said transition to said first level when said state means are in said interrupt state;

inhibiting means responsive to a transition to said first level on said interconnection for inhibiting the generation of any subsequent first level signal by said pulse generating means; and

reenabling means responsive to a single indicating an end of interrupt servicing for releasing the inhibiting by said inhibiting means.

4,631,671
DATA PROCESSING SYSTEM CAPABLE OF TRANSFERRING SINGLE-BYTE AND DOUBLE-BYTE DATA UNDER DMA CONTROL

Asayoshi Kawashita, Chigasaki, and Hirofumi Kuniga, Hadano, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

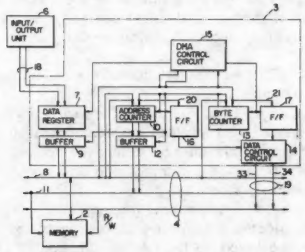
Filed Nov. 23, 1982, Ser. No. 443,873
Claims priority, application Japan, Nov. 26, 1981, 56-190258
Int. Cl.[4] G06F *3/04*
U.S. Cl. 364—200 **5 Claims**

1. In a data processing system having a processor and a memory connected to said processor via a system bus for storing bytes of data identified by even or odd addresses and being capable of reading or writing two bytes of data having an even and a succeeding odd address in one operation in response to receipt of the even address, an input/output adaptor connected to said system bus and at least one input/output unit for effecting DMA data transfer in a controlled manner at one byte per cycle or two bytes per cycle of the processor between said input/output unit and said memory comprising:

an address counter and a byte counter connected to said system bus to receive from the processor and store an

address for the memory and a byte number indicating the number of bytes of data to be transferred in a DMA operation, respectively, such that the bits of the address and the byte number are stored into stages of the address counter and byte counter by shifting the bits one bit to the right so that the least significant bit of the address and the byte number are not stored in the respective counters;

buffer means connected to said address counter and said



system bus for receiving the contents of said address counter and for supplying said contents along with an added bit in the least significant position to said system bus as an address which is always an even address; and

DMA control means for incrementing said address counter for each processor cycle a number of times according to said byte number, whereby DMA data transfer at two bytes per cycle is effected on the basis of the even addresses applied to said system bus from said buffer means.

4,631,672

ARITHMETIC CONTROL APPARATUS FOR A PIPELINE PROCESSING SYSTEM

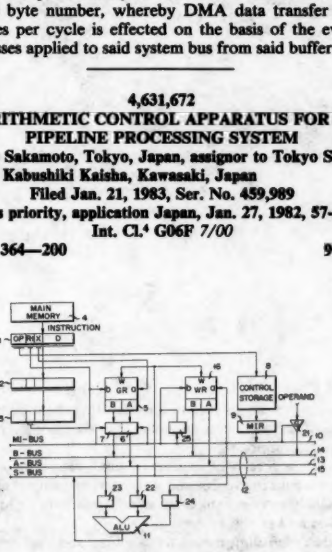
Tsutomu Sakamoto, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 21, 1983, Ser. No. 459,989

Claims priority, application Japan, Jan. 27, 1982, 57-11121

Int. Cl.[4] G06F *7/00*

U.S. Cl. 364—200 **9 Claims**



1. An arithmetic control apparatus for a pipeline processing system having

an instruction fetch stage, an operand address computation stage, an operand fetch stage, and an instruction execution stage, said arithmetic control apparatus comprising:

first instruction register means for storing an instruction at an end of said instruction fetch stage, for outputting said instruction during said operand address computation stage, and for transferring said instruction at an end of said operand address computation stage;

second instruction register means, coupled to said first instruction register means, for storing said instruction at said end of said operand address computation stage, and for transferring said instruction at an end of said operand fetch stage;

third instruction register means, coupled to said second instruction register means, for storing said instruction at said end of said operand fetch stage;

means, coupled to said first instruction register means, for storing microinstructions, and for outputting, during said operand fetch stage, a microinstruction corresponding to said instruction;

means, coupled to said microinstruction storing and outputting means, for storing data, and for outputting therefrom fetched operands during said operand fetch stage in accordance with said microinstruction, said third instruction register means also for outputting a portion of said instruction to said data storing and fetched operands outputting means; and

arithmetic and logic means, coupled to said microinstruction storing and outputting means and said data storing and fetched operands outputting means, for storing at an end of said operand fetch stage said fetched operands output by said data storing and fetched operands outputting means, for performing, during said instruction execution stage, an arithmetic operation upon said fetched operands in accordance with said microinstruction, and for outputting at an end of said instruction execution stage a result of said arithmetic operation to said data storing and fetched operands outputting means.

4,631,673

METHOD FOR REFRESHING MULTICOLUMN TABLES IN A RELATIONAL DATA BASE USING MINIMAL INFORMATION

Laura M. Haas, Palo Alto, and Bruce G. Lindsay, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 22, 1985, Ser. No. 693,500

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—300 **3 Claims**

```
        This is the procedure followed at the base table site, after receiving
      the value SNAP_NEED with a refresh request from the snapshot site.

    delete = 0;
    last_tid = 0;
    expect_last = 0;
    last_in_snapshot = 0;
    open_segment_scan(base_relation);

    forever do;
                                /* scan the base table in tid order */
      next = fetch next_record;
      if end_of_scan then break;
      new_expect = next.tid;

      if next.prev = NULL
        then do;   /* this is a record inserted since last refresh of any */
                   /* snapshot on this table.                             */
          newid = get_new_vid;
          next.vid = newid;
          next.prev = last_tid;
          update_record(next);
          new_expect = expect_last;   /* inserted tuple doesn't change */
                                      /* our expectations, so restore  */
        end;  /* of inserted record */

        elseif next.prev -= expect_last
          then do;  /* there have been one or more records deleted */
            newid = get_new_vid;
            next.vid = newid;
            delete = max(newid,delete);
            next.prev = last_tid;
            update_record(next);
          end;  /* of deleted run */

          elseif next.prev -= last_tid
            then do;  /* fix prev reference due to insertion */
              next.prev = last_tid;
              update_record(next);
            end;

      if next.vid = NULL
        then do;  /* record updated since last refresh scan */
          newid = get_new_vid;
          next.vid = newid;
          update_record(next);
          delete = max(newid,delete);
        end;  /* updated record */
```

1. A method for updating an extensible multicolumn table (snapshot table) which is a subset of a logically independent extensible multicolumn table (base table) in a nodal network of a distributed relational data base system, each row entry of the base table being assigned a unique identifier, said data base system having local means for generating time stamps in ascending order upon demand, said method comprising the steps of:

(a) defining on the base table a partial ordering of time stamps on the row updates (insertions, deletions, modifications), a total ordering of row entry identifiers, and a backward chaining of the identifiers of adjacent row entries;

(b) scanning the base table and detecting changes thereto as anomalies to the orderings or chaining; and

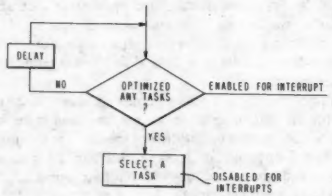
(c) communicating the anomalies to the snapshot table and altering its contents therewith.

4,631,674

ACTIVE WAIT

Geoffrey O. Blandy, New Paltz, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 5, 1985, Ser. No. 698,304
Int. Cl.[4] G06F *9/46*
U.S. Cl. 364—300 **3 Claims**



1. In a tightly coupled multiprocessor system configured so as to process tasks at least some of which are required to be processed by only one processor at a time, and in which the operation of an Active processor can lead to the readying or creation of a dispatchable task, a method of causing an Idle processor to select a task readied by an Active processor, comprising the steps of:

enabling a first processor for interrupt when the first processor detects that it is Idle;

detecting, by said first processor, whether a readied, dispatchable task eligible to be run on said first processor exists in the system;

disabling said first processor for interrupt if such a dispatchable task is found by said first processor; and then

selecting said task, for running on said first processor; and

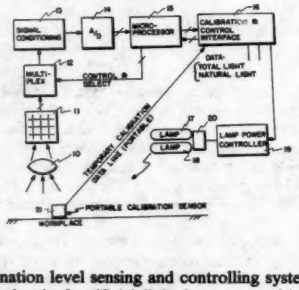
repeating the step of detecting after a predetermined delay selected to reduce interference between said first processor and other processors in the system, if such a dispatchable task is not found by said first processor.

4,631,675

AUTOMATIC LIGHT-INTENSITY CONTROL

William F. M. Jacobsen, Blaine, Minn., and Zoltan Zansky, Willowdale, Canada, assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 20, 1984, Ser. No. 632,786
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—400 **8 Claims**



1. An illumination level sensing and controlling system for controlling the level of artificial light in an area of interest comprising:

light collector means capable of receiving light from a wide angle such that the light received is representative of a relatively large portion of said area of interest and focusing said light on a two-dimensional surface;

two-dimensional light-sensitive array means including a matrix of light-intensity sensitive elements disposed to receive the light focused by said light collector means in a manner such that the matrix of light-sensitive elements produces an output corresponding to a light-intensity mapping of the area from which said light is collected;

multiplexer means for addressing each of said light-intensity sensitive elements and determining the relative light intensity value thereof, said values being representative of the light intensity in corresponding portions of the controlled area;

signal conditioning means including means for digitizing said light intensity values;

microprocessor means for storing control values associated with desired light levels of the area of interest, processing the digitized data and controlling the operation and control functions of the system based on a comparison with said control values; and

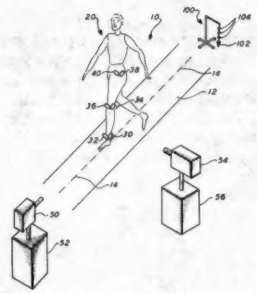
control means for controlling the light level of one or more lamps associated with the illumination of the area to be controlled based on the control function of said microprocessor means.

4,631,676

COMPUTERIZED VIDEO GAIT AND MOTION ANALYSIS SYSTEM AND METHOD

James W. Pugh, 115 E. 9th St., New York, N.Y. 10003

Filed May 25, 1983, Ser. No. 497,823
Int. Cl.[4] A61B *5/10*
U.S. Cl. 364—413 **18 Claims**



1. A motion analysis system for analyzing the movements of a portion of the body of a subject as it moves along a predetermined path; comprising:

(a) marking means of relatively small size and weight in comparison to the size and weight of the subject and being attachable to the subject so as not to modify or hinder the movement of the subject;

(b) video recording means for viewing and making a video record of the movements of the subject over a predetermined period of time, and at a recording rate of sixty frames per second, said video recording means being formed to be particularly sensative to said marking means;

(c) minicomputer means connected to said video recording means and coacting therewith for receiving frame by frame views of the movements of the subject and more particularly the images of said marking means as viewed by said video recording means;

(d) said minicomputer means including video analysis means for receiving and for sequentially digitizing, into a predetermined array of pixels, each of said views of said movement of said subject and said marker as viewed by said video recording means;

(e) each said pixel having predetermined horizontal and vertical coordinates with respect to horizontal and vertical reference lines and having a gray level corresponding to the brightness of that part of the image represented by said pixel and particularly the brightness of the image of said marking means as viewed by said video recording means;

(f) first program means coacting with said minicomputer to effect scanning of each said pixel array and for setting a first threshold of gray level above which said minicomputer will respond and provide a predetermined indication thereof, and for changing said first threshold to a second threshold of gray level when said minicomputer fails to respond to a pixel of at least said first threshold of gray level in a frame at the approximate horizontal and vertical coordinates of a pixel previously responded to by said minicomputer in the previous last scanned frame;

(g) said first program means coacting with said minicomputer to locate, by x and y type data coordinates, each of said pixels responded to by said minicomputer for each frame so viewed and to record same, and to thereafter automatically and similarly locate each of said pixels having at least the gray level established by said first program for such pixel for all of said frames so viewed and to record same;

(h) computer means coacting with said minicomputer means for receiving said pixel data coordinates and for combining same into a predetermined data display;

(i) and data output means coacting with said computer means for providing a visual depiction of said predetermined data display.

4,631,677

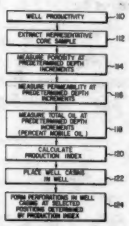
METHOD FOR DETERMINING THE PLACEMENT OF PERFORATIONS IN A WELL CASING

Arthur Park, Odessa, and Bob T. Wilson, Midland, both of Tex., assignors to Diamond Oil Well Drilling Company, Midland, Tex.

Filed Jun. 1, 1984, Ser. No. 616,410

Int. Cl.[4] G01V *1/00*; G01N *15/08*; E21B *49/00*

U.S. Cl. 364—422 **13 Claims**



1. A method for determining the productivity of a well site, comprising:

extracting a representative core sample of a formation of interest from the well site utilizing sponge coring techniques, the portion of the total oil that bleeds out of the core sample absorbed by the sponge utilized in sponge coring techniques;

measuring the porosity of the core sample at predetermined depth increments;

measuring the fraction of the core space in the core sample occupied by total oil at each of the predetermined depth increments, the total oil equal to the oil remaining in the core on the surface of the well in addition to the oil that bleeds out of the core sample upon extraction thereof, the fraction equal to the percent mobile oil;

determining a Production Index to indicate the producibility of the well as a function of depth increments, the Production Index varying directly with the product of the porosity, permeability and percent mobile oil; and

placing a well casing in a well that is disposed in the formation of interest and placing perforations in the well casing at selected positions determined by the Production Index such that the selected perforations are located at depths having a Production Index greater than a predetermined number along the formation of interest.

4,631,678

INFORMATION INPUT

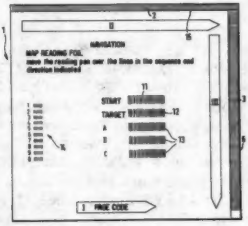
Helmut Angermüller, Frankfurt am Main, and Günther Hahlganss, Kriftel, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed May 18, 1984, Ser. No. 612,102

Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319224

Int. Cl.[4] G06F *15/50*

U.S. Cl. 364—424 **22 Claims**



1. A system for identifying locations on a map for inputting data of the locations into an optical map reading device of a navigation device, the locations including a start point and a target point, the navigation device including a data processor, the system comprising

stencil means configured for emplacement on the map for measuring coordinate distances on the map, said stencil means including a mark for association with a starting point or target point on the map, and

location marking means constructed with optically readable location markings, and being disposed on said stencil means for inputting location data into said reading device for use by said data processor, said location data being inputted upon alignment of said mark of said stencil means with a coordinate of the starting point or target point.

4,631,679

GEARSHIFT SELECTION SYSTEM FOR A POWER-ASSISTED TRANSMISSION

Alfred Klatt, Wathlingen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 26, 1983, Ser. No. 535,484

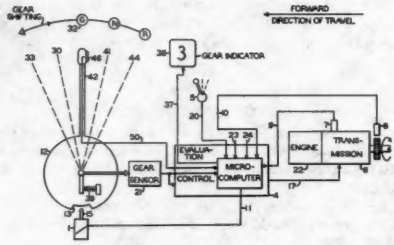
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3237509

Int. Cl.[4] G05G *5/04*; F16H *57/06, 5/80*

U.S. Cl. 364—424.1 **5 Claims**

1. A vehicle gearshift selection system for a power-assisted transmission comprising, a unilateral gearshift actuator is capable of being shifted by a driver to cause a gear change of the transmission, a gear sensor for sensing the position of said unilateral gearshift actuator, and an evaluation control circuit for receiving a gearshift command signal from said gear sensor and for receiving input signals representing the gas pedal position, the vehicle speed and the load carried by the vehicle for calculating and computing an optimum new gear and for allowing a shift-up or shift-down into the optimum new gear of

the transmission when said unilateral gearshift actuator is shifted to an initial speed selection position by the driver and for permitting said unilateral gear shift actuator to be shifted



beyond said initial speed selection position when the optimum new gear is engaged by causing a stop pin to be withdrawn from a notch of a locking device.

4,631,680

PROCESS FOR OPTIMIZING THE IGNITION ADVANCE OF AN INTERNAL COMBUSTION ENGINE

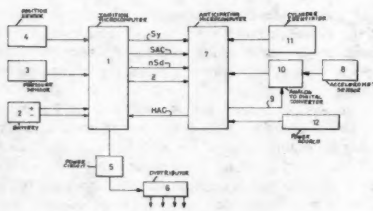
Jean P. Korb, Joinville Le Pont, and Jean P. Lagrue, Palaiseau, both of France, assignors to Regie Nationale des Usines Renault, Boulogne Billancourt, France

Filed Jul. 8, 1983, Ser. No. 511,946

Claims priority, application France, Jul. 20, 1982, 82 12628

Int. Cl.[4] F02P *5/15;* **G06F** *15/20*

U.S. Cl. 364—431.05 **13 Claims**



1. Process for optimizing the ignition advance of an internal combustion engine equipped with a computer containing a programmed law for ignition advance as a function of the speed and the load of the engine and a system for detection of pinging that supplies data representative of the presence or absence of pinging for each engine stroke, according to which there is determined, as a function of the speed and the load of the engine, at least two operating zones, namely a critical zone and a noncritical zone and, in the case of detection of pinging in the critical zone, the ignition advance generated during at least one of the following engine strokes is delayed, comprising the following steps in response to the detection of pinging of a cylinder in the critical zone concerned:

delaying the ignition advance of the cylinder concerned by n_1+n_2 degrees in relation to the programmed law of advance; and

controlling the return of the programmed advance of said cylinder at a fast rate and a slow rate by decrement of n_1 at a high speed and of n_2 at a low speed respectively;

wherein said process further comprises the following steps in response to a fast rate correction occurring during a passage from the critical zone to the noncritical zone;

cancelling said fast rate correction occurring during said passage from the critical zone to the noncritical zone;

storing the value of n_2 occurring during a passage from the critical zone to the noncritical zone; and

suspending the advance correction and the decrement of n_2 at the slow rate until the following passage from the noncritical zone to the critical zone where the correction and the decrement of n_2 at the slow rate is resumed.

4,631,681

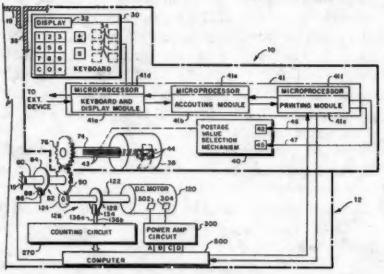
MICROPROCESSOR CONTROLLED D.C. MOTOR AND APPLICATION THEREFOR

Edilberto I. Salazar, Brookfield; Wallace Kirschner, Trumbull; John L. Lorenzo, Southbury; Keith E. Schubert, West Norwalk, and Philip Pollak, Jr., Westport, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 4, 1984, Ser. No. 657,569

Int. Cl.[4] G06F *15/20;* **H02P** *5/06;* **H02K** *37/00*

U.S. Cl. 364—464 **25 Claims**



1. In combination with a postage meter including a rotary drum having a periphery adapted for feeding a sheet in a path of travel, an improvement comprising:

(a) first means for sensing a time interval during which a sheet is linearly displaced a predetermined distance in the path of travel;

(b) a d.c. motor coupled to the drum for rotation thereof;

(c) second means for sensing angular displacement of the drum; and,

(d) computer means coupled to the first and second sensing means and to the d.c. motor, the computer means comprising:

(i) means responsive to the first sensing means for providing respective amounts representative of desired angular displacements of the drum during successive sampling time periods,

(ii) means responsive to the second sensing means for providing respective amounts representative of actual angular displacements of the drum during successive sampling time periods, and

(iii) means for compensating for the difference between desired and actual angular displacements and generating a d.c. motor control signal for controlling rotation of the motor to cause the linear displacement of the periphery of the drum to substantially match the linear displacement of the sheet during respective sampling time periods.

4,631,682

METHOD AND APPARATUS FOR CONTROLLING A WINDER FOR STOP-TO-LENGTH OR STOP-TO-ROLL DIAMETER

David T. Ng, Rockford, Ill., and Roger C. Brendemuehl, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Aug. 7, 1984, Ser. No. 638,408

Int. Cl.[4] B65H *17/12, 25/00*

U.S. Cl. 364—471 **7 Claims**

7. A winder control comprising:

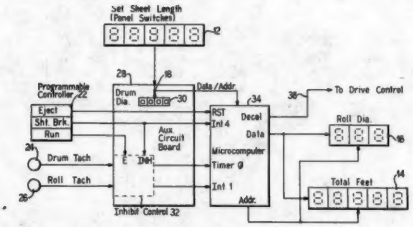
a rotatable support drum and a drum tachometer for producing first tachometer pulses;

a rotatable roll for winding a sheet thereon and a roll tachometer for producing second tachometer pulses;

drive means connected to and operable to cause rotation of said drum and roll, including a drive circuit switchable between a first deceleration rate and a lower second deceleration rate;

first means for storing target information representing desired wound up sheet length;

second means connected to said drum and roll tachometers for counting and storing the respective tachometer pulses as representing an cumulative length; and



said second means including third means connected to said first means and to said drive circuit, said third means operable to determine an anticipated stopping distance from the speed and the drive deceleration rate and cause said drive circuit to operate at said first deceleration rate when the sum of the stopping distance and the cumulative length is greater than the target length and at said lower, second deceleration rate when such sum is less than the target length.

4,631,683

ACOUSTIC DETECTION OF CONTACT BETWEEN CUTTING TOOL AND WORKPIECE

Charles E. Thomas, Scotia; Minyoung Lee, Schenectady; James F. Bedard, Schenectady; Steven R. Hayashi, Schenectady, and William S. Yerazunis, Troy, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 29, 1984, Ser. No. 645,203

Int. Cl.[4] G06F *15/46*; G01N *24/04*; G01M *7/00*

U.S. Cl. 364—474 **14 Claims**

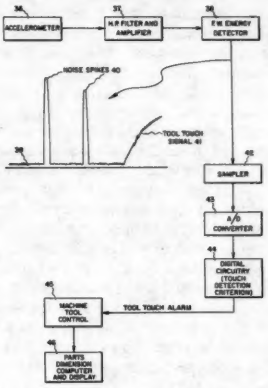
1. An improved system for acoustic detection of the initial touch of a cutting tool to a workpiece on a machine tool comprising:

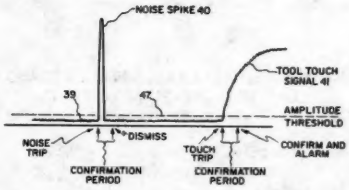
a vibration sensor which is most sensitive to frequencies around a resonant frequency and is positioned on said machine tool to sense vibrations at the tool-workpiece interface and convert these and other vibrations to an electrical signal;

an analog preprocessor including means to high-pass filter and amplify said vibration signal to discriminate against lower frequency machinery noise, and means to rectify and low-pass filter said signal and detect the energy in a band around said resonant frequency;

means for sampling the signal at the preprocessor output and converting each sample to digital form; and

digital signal pattern recognition circuitry comprising means for comparing each sample with a preset amplitude threshold level which is a minimum factor above the continuous noise level produced by operation of said machine tool with no tool-workpiece contact, and means for detecting a sample amplitude above said threshold and then confirming detection of a tool touch signal while ignoring pre-touch high amplitude spiky noise pulses, and





generating a touch alarm signal to be sent to the machine tool control to stop the advance of said cutting tool.

4,631,684

TOOL SUPPORT SYNCHRONIZING SYSTEM FOR NUMERICAL CONTROL APPARATUS

Kyosuke Akasofu, and Kiyoshi Kuchiki, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1984, Ser. No. 592,205

Claims priority, application Japan, Mar. 22, 1983, 58-47478

Int. Cl.[4] G05B *19/18*

U.S. Cl. 364—474 **7 Claims**

FIG. 5A

FIG. 5B

1. In a tool post synchronizing system for a numerical control apparatus for controlling a tool machine having a plurality of tool supports through control circuitry, a tool support synchronizing system for said numerical control apparatus comprising:

reading means provided for each tool support for reading an independent work program for controlling each of said tool supports;

command decode processing means for decoding commands of said independent work programs read by said reading means to output a signal;

control circuit means for controlling shifting means for

shifting said tool supports in accordance with said signal from said command decode processing means; and

synchronization controlling means for controlling said control circuit means and guiding execution of said independent work programs in synchronization with one another when said command decode processing means decodes a synchronizing command from said independent work programs and composed of a predetermined single character or symbol in the form of a mark not usually used in said independent work programs;

wherein said command decode processing means comprises a coincidence circuit for sensing the coincidence of a code pattern with said synchronizing command, an output of said coincidence circuit representing coincidence being supplied to said synchronization controlling means,

wherein said control circuitry comprises a programmable controller coupled to said central circuit means for controlling an auxiliary function of said tool machine; and

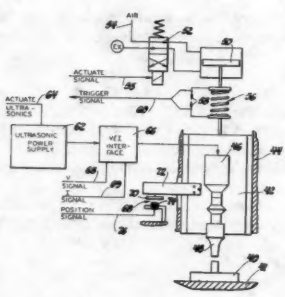
wherein said synchronization controlling means includes means for preventing execution of the shifting of a tool support during a period from receipt of a synchronizing command of the work program for said tool support until detection of a synchronizing command of a work program for another tool support.

4,631,685

METHOD AND APPARATUS FOR ULTRASONIC PLASTIC FORMING AND JOINING

David A. Peter, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 7, 1984, Ser. No. 679,364
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—476 **8 Claims**



1. A method of dimensional control in ultrasonic processing of work comprising one or more plastic parts to be deformed, comprising the steps of;

applying force to a surface of the work and sensing a preset force value,

when the preset force value is attained, measuring the surface position to establish an initial dimension and initiating ultrasonic energy application to the work,

monitoring surface displacements occurring after initiating the ultrasonic energy,

terminating ultrasonic energy when the surface displacement reaches a preset value,

then maintaining force on the surface for a hold period and thereafter releasing the force, and

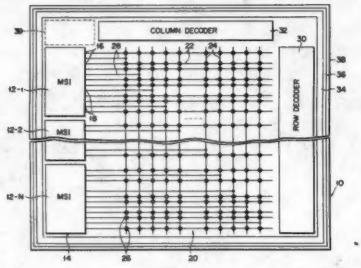
measuring overall surface displacement after the hold period when the force is at the preset value, thereby determining the dimensional change due to deformation of the work.

4,631,686

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Yasuo Ikawa, Tokyo; Tadashi Shibata; Kiyoshi Ueui, both of Yokohama; Misao Miyata, Tokyo; Masahiko Kawamura, Yokohama, and Noboru Amano, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 31, 1984, Ser. No. 646,121
Claims priority, application Japan, Aug. 31, 1983, 58-157718
Int. Cl.[4] H03K *19/173;* H04Q *9/00*
U.S. Cl. 364—490 **17 Claims**



1. A semiconductor integrated circuit device comprising:

(a) a semiconductive substrate;

(b) a plurality of different kinds of functional elements formed on said substrate, each having a predetermined unit logic function and having at least one input terminal and at least one output terminal;

(c) first wiring lines formed on an area of said substrate adjacent to said functional elements and extending in a first direction, each said first wiring line being connected to one of the input terminal and the output terminal of the corresponding functional element;

(d) second wiring lines formed on said substrate area to be electrically insulated from said first wiring lines and extending in a second direction, each said second wiring line being connected to the other of the input terminal and the output terminal of the corresponding functional element, said second wiring lines forming mutually electrically insulated crossing points with said first wiring lines;

(e) first switching elements provided at said crossing points between said first and second wiring lines and connected to corresponding first and second wiring lines, said first switching elements being capable of changing their own electrical state at least once between conductive and non-conductive states; and

(f) wiring pattern make-up means, connected to said switching elements, for supplying electric signals necessary for setting given electrical states of said switching elements to set a given mutual wiring of said functional elements through shortest signal transmission paths using said first and second wiring lines, thereby realizing an exclusive custom device function conforming to a given specification.

4,631,687

METHOD AND APPARATUS FOR ANALYSIS EMPLOYING MULTIPLE SEPARATION PROCESSES

Bruce R. Kowalski, and Gilson H. Rohrback, both of Seattle, Wash., assignors to Rohrback Technology Corporation, Seattle, Wash.

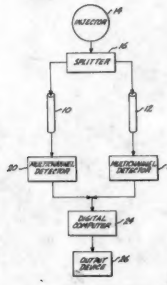
Filed Nov. 3, 1983, Ser. No. 548,493
Int. Cl.[4] G01N *31/00;* G06F *15/46*
U.S. Cl. 364—497 **29 Claims**

1. A method for analyzing a sample in order to produce data corresponding to a set of properties of at least one of the individual components thereof, the properties being selected such

that said set of properties is adequate for identifying at least one of said components, said method comprising the steps of:

subjecting said sample to a plurality of separation processes, the separation processes being adapted to produce a corresponding plurality of different distributions of the sample;

determining said set of properties of the sample, to produce a corresponding sample set, at each of a plurality of positions along each of said distributions;



determining one or more basic sets for each separation process, such that all sample sets corresponding to the distribution produced by that process can be represented by the basic sets for that process; and

comparing the basic sets for the different processes with one another to thereby identify one or more common basic sets such that all of the sample sets can be represented by the common basic sets, whereby said common basic sets are estimates of said set of properties for individual components.

4,631,688

METHOD OF AND APPARATUS FOR TESTING A METAL BODY BY MEANS OF EDDY CURRENTS

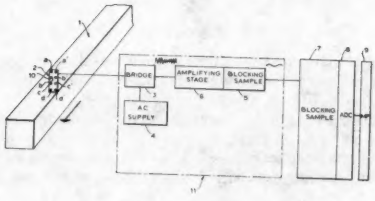
Bernard Boehm, 35, rue de la Croix de Fer, 78100 Saint-Germain-en-Laye, and Marc Lacroix, 6, Impasse des Pêcheries, 78230 Le Pecq, both of France

Filed Jun. 6, 1980, Ser. No. 157,632

Claims priority, application France, Jun. 14, 1979, 79 15481

Int. Cl.[4] G06F *15/20*; G01R *33/12*

U.S. Cl. 364—507 **10 Claims**



1. A method of inspecting a metal body for defects, the method comprising the steps of:

relatively longitudinally displacing the body and a plurality of pairs of coils connected in respective bridge circuits;

exciting the bridge circuits with alternating current;

exciting the coils with alternating current so that eddy-current variations caused by defects in the body become impedance variations of the coils which in turn become imbalance signals in the respective bridges;

demodulating the imbalance signals to form respective imbalance voltages;

periodically sampling the demodulated imbalance voltages;

storing the levels of the sampled demodulated voltages;

averaging the sampled demodulated voltages of each bridge to produce respective base lines;

comparing the respective stored levels of each sampled voltage with the respective base line and generating respective error signals corresponding to the differences;

comparing each of these error signals with a relatively low threshold corresponding to the smallest defect to be detected and with a relatively high threshold;

establishing a longitudinal succession of at least abutting zones on the body and summing error signals for each zone to obtain sums of error signals for each zone; and

comparing each of these sums with a predetermined threshold, whereby when one of the error signals exceeds only said relatively low threshold it indicates a small defect, when one of the error signals exceeds said relatively high threshold it indicates a large defect, and when one of the sums exceeds said predetermined threshold it indicates a long defect.

4,631,689

MULTI-JOINT ARM ROBOT APPARATUS

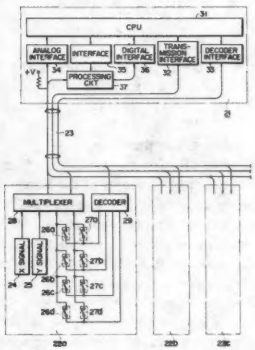
Yoshiaki Arimura, Yokohama; Masao Obama, Yokosuka, and Yutaka Hitomi, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 20, 1984, Ser. No. 591,492

Claims priority, application Japan, Mar. 26, 1983, 58-50711

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—513 **3 Claims**



1. A multi-joint arm robot apparatus, comprising:

a multi-joint arm including a plurality of unit arms connected to tandem through a joint sections;

means provided in said multi-joint arm for driving each of said joints to move said multi-joint arm;

state detecting means, provided in each of said joint sections, including rotation angle detecting means for detecting a rotation angle of a corresponding joint section to provide rotation angle signals representative of a joint rotation angle in an analog form, and

obstacle detecting means for detecting whether a unit arm associated with the corresponding joint section is brought into contact with obstacles to provide obstacle detect signals in a binary form when the unit arm contacts obstacles;

signal processing means responsive to said state detecting means for driving said joint driving means to move said multi-joint arm on a path; said signal processing means being arranged to transmit common control signals to said state detecting means of said joint sections so that said state detecting means of said joint sections are successively enabled; and said state detecting means of said joint sections each being arranged to transmit, when enabled by

said signal processing means, the obstacle detection signals and the rotation angle signals to said signal processing means on a multiplexing basis.

4,631,690

MULTIPROCESSOR COMPUTER SYSTEM FOR FORMING A COLOR PICTURE FROM OBJECT ELEMENTS DEFINED IN A HIERARCHIC DATA STRUCTURE

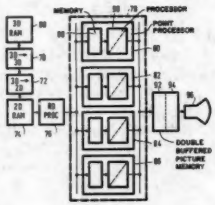
Marc E. A. Corthout, and Pieter M. Mieleksamp, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1984, Ser. No. 589,264

Claims priority, application Netherlands, Mar. 10, 1982, 8300872

Int. Cl.[4] G06F *15/40, 15/626;* G09G *1/14*

U.S. Cl. 364—518 **12 Claims**



8. A multiprocessor computer system for forming a picture on a display field of a display member from object elements which are defined in a hierarchic data structure, said system comprising:

(a) a connection for a host processor;

(b) an input memory (74) fed by said connection for storing elementary level object elements in the form of respective Bezier polygons each of which is exclusively defined by the describing points of its polygon sides and furthermore storing for each next-higher hierarchic level two-dimensional transformation functions that form object elements of said next-higher level, up to a highest hierarchic level having a two-dimensional data structure;

(c) an array of point-processors (80, 82, 84, 86) fed in parallel by said input memory and being each assigned to a rectangular subfield of said display field, each of said point processors having state-sequencing means, for operating in a first state as a structure processor for determining, for each assigned point starting from the highest level and progressively for each next-lower level of the data structure, the application coordinates of said assigned point within any object element of that level until such object element is either found to be irrelevant for the point in question or is found to be an elementary object element; for operating in a second state as a polygon processor for calculating, for each elementary object element thus found in a first state a binary inside/outside indicator and generating a list of all relevant elementary object elements for which an "inside" value applies with respect to the current point, associated with such elementary object's color information; and for operating in a third state, in case of a list of more than one elementary object element thus generated, as a priority processor for determining a priority among the latter object elements and producing therefrom a color information for the pixel in question; and

(d) a cyclically operable multiplexer (176) for receiving the color information generated by the point-processors for forwarding to said display member.

4,631,691

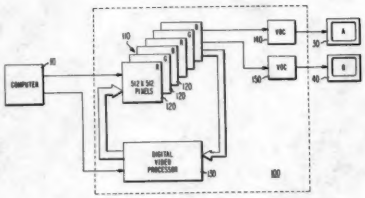
VIDEO DISPLAY DEVICE SIMULATION APPARATUS AND METHOD

Albert P. Pica, Middlesex County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 14, 1984, Ser. No. 610,006

Int. Cl.[4] G06F *3/14*

U.S. Cl. 364—521 **9 Claims**



9. An apparatus for simulating a video display device comprising:

a computer for controlling the simulation;

means responsive to the computer for replicating on a test image the effects of at least one parameter of the simulated display device; and

a video monitor for displaying the output from the replicating means.

4,631,692

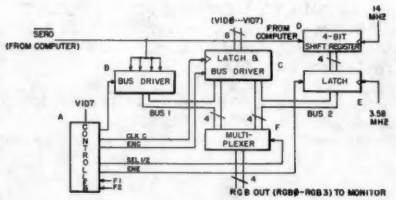
RGB INTERFACE

Walter F. Broedner, San Jose, Calif., assignor to Video-7 Incorporated, Milpitas, Calif.

Filed Sep. 21, 1984, Ser. No. 653,491

Int. Cl.[4] G06F *15/626;* G09G *3/02, 1/28;* H04N *1/46*

U.S. Cl. 364—518 **6 Claims**



1. A multi-mode video interface for use in adapting an Apple TM II-series computer having an NTSC-type video output for driving an RGB-type monitor, comprising:

means for receiving first and second video mode controlling flags from said computer;

means for receiving serial video data from said computer;

means for receiving parallel video bus data from said computer;

an RGB output bus for driving said RGB-type monitor;

means for receiving a clock signal from said computer;

binary switch means, responsive to said first and second flags, for generating first and second binary switches F1 and F2 for controlling an output video mode of said interface;

means for controlling the states of said first and second flags to select a video mode; and

RGB conversion circuit means for providing, in response to said clock signal, flags, parallel video data and serial video data RGB video data on said RGB output bus, said circuit comprising:

a controller, responsive to said binary switches F1 and F2 for steering video data;

a bus driver, under the control of said controller for receiving said serial video data and placing it on a first four bit bus;

a shift register circuit, having a data input for receiving said serial data and a clock input for receiving said clock signal, for outputting serial data onto a shift register output bus;

a first latch having an input coupled to said shift register output bus for latching data therefrom onto a second bus;

a second latch and bus driver having an input video bus receiving said parallel data and first and second outputs coupled to said first and second buses respectively; and

a multiplexer for providing said RGB video data to said RGB bus.

4,631,693

SYSTEM FOR MONITORING THE OPERATION OF OUTPUT TRANSDUCERS OF A CENTRAL CONTROL AND MONITORING UNIT FOR MACHINES AND/OR DEVICES USABLE IN PRODUCTION AND/OR PRODUCT PACKAGING LINES

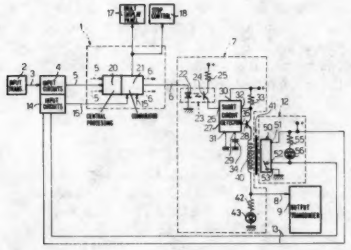
Armando Neri, Bologna, Italy, assignor to G.D. Societa per Azioni, Bologna, Italy

Filed Dec. 28, 1983, Ser. No. 566,370

Claims priority, application Italy, Feb. 15, 1983, 3336 A/83

Int. Cl.⁴ G01R *31/34*; G05B *9/02*; G08B *21/00*; G01P *13/00*

U.S. Cl. 364—550 **8 Claims**



1. A monitoring system for a machine used in a production line, said system comprising a central control unit; an output circuit connected to said central control unit; an output transducer connected to said output circuit; a monitoring circuit means associated with said output circuit for detecting the passage of current in said output transducer, said monitoring circuit means generating a comparison signal, there being no direct electrical connection between said monitoring circuit means and said output circuit; said central control unit including a control circuit which emits a control signal for said output transducer and receives the comparison signal from said monitoring circuit means; a stop control means to stop the machine; a first luminous indicator; said control circuit including means to emit a signal to said stop control means to stop the machine and send a signal to said first luminous indicator, whereby in the event of loss of said comparison signal said means to emit a stop signal is activated to stop the machinery.

4,631,694

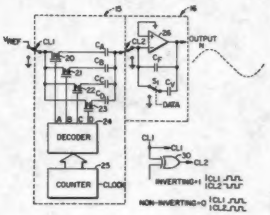
SINE WAVE SYNTHESIZER

Peter S. Single, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 27, 1984, Ser. No. 604,718

Int. Cl.⁴ G06F *1/02*

U.S. Cl. 364—608 **13 Claims**



9. In an integrated circuit, a sine wave synthesizer circuit, comprising:

an integrator;

at least two selectable integration constant capacitors;

a reference source;

at least two switches, one of each coupled in a series with a corresponding one of said integration constant capacitors and operable to select said integration constant capacitor;

decoder means, coupled to said switches, for sequential operation of said switches to select an integration constant capacitor from among said selectable integration constant capacitors in a sequence and at a rate corresponding to a desired sine wave frequency; and

means for effecting switched capacitor phasing of said integration constant capacitors, including:

a first phase switch for alternately coupling a first terminal of a selected integration constant capacitor between a reference source and a circuit ground; and

a second phase switch, for alternately coupling a second terminal of said selected integration constant capacitor between an integrator input and said circuit ground;

whereby operation of said first and second phase switches at the same time produces transition of said sine wave in a first direction; and

whereby operation of said first and second phase switches 180° out-of-phase produces transition of said sine wave in a second, opposite direction, such that coordinated operation of said first and second phase switches and said decoder operates said circuit to produce a sloped line approximation of a sine wave output signal.

4,631,695

DETECTOR OF PREDETERMINED PATTERNS OF ENCODED DATA SIGNALS

Tony J. Kozlik, Phoenix, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 24, 1984, Ser. No. 573,899

Int. Cl.⁴ G06F *7/02*

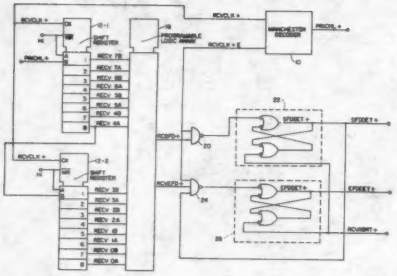
U.S. Cl. 364—715 **5 Claims**

1. A detector for a unique pattern of Manchester encoded data in serially received Manchester encoded data signals in which each bit of data is in a Manchester bit cell with each such Manchester bit cell being divisible into two half-bit cells, comprising:

means for producing a receive clock signal in synchronism with the encoded data signal as received, said receive clock signal having a voltage transition of one plarity substantially in the center of each half-bit cell of each Manchester bit cell of the received signal;

receive data shift register means to which the encoded data signal and receive clock signal are applied for storing voltage levels of the encoded data signal at each voltage

transition of one polarity of the receive clock, said shift register means storing the voltage levels of all of the half-bit cells of said pattern of the data signals; and



programmable array logic means to which all of the voltage levels stored in the receive data shift register means are applied for producing an output signal when the pattern of voltages stored in the receive data shift register is said unique pattern.

4,631,696

FIXED-POINT DATA/FLOATING-POINT DATA CONVERTING APPARATUS

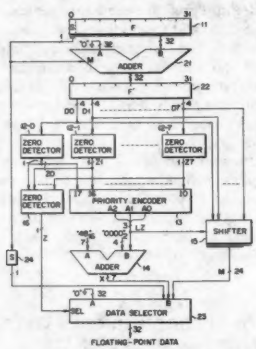
Tsutomu Sakamoto, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 24, 1984, Ser. No. 573,347

Claims priority, application Japan, Jan. 28, 1983, 58-12527

Int. Cl.[4] G06F *7/38, 5/00*

U.S. Cl. 364—748 **11 Claims**



1. A fixed-point data/floating-point data converting apparatus comprising:

a priority encoder, for respectively receiving signals which indicate whether or not the digits of a first fixed-point data are "0", to thereby generate a number of continuous "zero" digits from a most significant digit of the first fixed-point data, in accordance with the signals;

a shifter for shifting the first fixed-point data to the left by the number of continuous "zero" digits from said priority encoder, thereby obtaining a mantissa part;

subtracting means for subtracting the number of continuous "zero" digits from a reference value, thereby obtaining an exponent part; and

means for generating floating-point data normalized in accordance with the mantissa part from said shifter and the exponent part from said subtracting means.

4,631,697

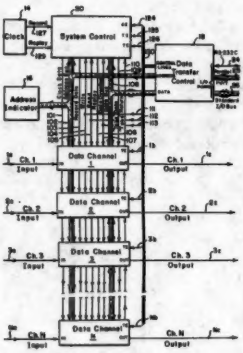
SIGNAL CONTROLLED WAVEFORM RECORDER

Hugo S. Ferguson, Averill Park, N.Y., assignor to Duffers Scientific, Inc., Troy, N.Y.

Continuation-in-part of Ser. No. 522,356, Aug. 11, 1983, abandoned. This application Nov. 30, 1984, Ser. No. 676,915

Int. Cl.[4] G06F *3/05, 3/06*

U.S. Cl. 364—900 **14 Claims**



1. A signal controlled waveform recorder having a plurality of data channels for recording selected portions of the signals supplied to the data channels of said recorder, said recorder comprising;

(a) latch means for each of said plural data channels, each being responsive to an assigned data input signal and a clock pulse to provide latch values of the assigned data input signals;

(b) means for producing digital output signals having substantially the same logical values as those of previously stored values of said input signals;

(c) means for comparing the logical values of said input signals and said digital output signals and producing control signals responsive to any logical differences occurring therebetween; and

(d) means responsive to said control signals for storing in parallel the latched values of said input signals.

4,631,698

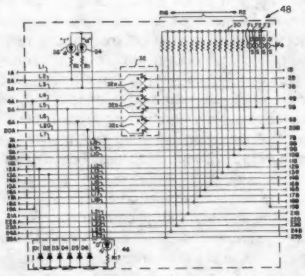
INTERFACE APPARATUS

Joseph F. Walsh, and William P. Dean, both of King County, Wash., assignors to IQ Technologies, Inc., Bellevue, Wash.

Filed Jul. 29, 1983, Ser. No. 518,404

Int. Cl.[4] G06F *13/42;* H04B *17/00*

U.S. Cl. 364—900 **35 Claims**



1. An interface apparatus for interconnecting computers and

peripheral devices with external connectors having mismatched data signal lines or open inputs on handshake or control signal lines, comprising:

means for electrically interconnecting a pair of designated data signal lines of a first computer or peripheral device connector with a pair of designated data signal lines of a second computer or peripheral device connector;

detection means for detecting mismatching interconnections of said pairs of data signal lines;

switching means responsive to a detected mismatch by said detection means for selectively reversing the electrical interconnection of said pairs of data signal lines;

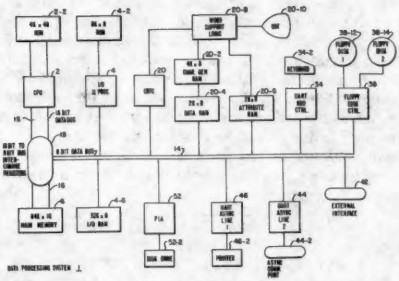
interconnecting means for electrically interconnecting a plurality of designated handshake and control signal lines of said first connector with a plurality of designated handshake and control signal lines of said second connector; and

means for detecting an enable signal on at least one of said designated handshake or control lines of said first or second connectors and detecting an open input on any other of said designated handshake or control signal lines of said first or second connectors, and in response to said detected enable signal supplying a non-linear current-limited enable signal to one or more of said other handshake or control signal lines detected as having an open input.

4,631,699
FIRMWARE SIMULATION OF DISKETTE DATA VIA A VIDEO SIGNAL

James C. Siwik, Nashua; Thomas L. Murray, Jr., Merrimack, both of N.H., and Thomas O. Holtey, Newton, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 30, 1982, Ser. No. 445,631
Int. Cl.[4] G06F *11/00*
U.S. Cl. 364—900 **10 Claims**



1. A data processing system including apparatus for verifying the integrity of the system by using a cathode ray tube (CRT) subsystem to generate a stream of data bits to simulate the flow of information between a disk and a disk controller comprising:

data random access memory (RAM) means for storing data bytes having a fixed format, each of said data bytes being represented by combinations of clock bit cells, data bit cells and no bit cells, each of said clock bit cells being represented by a first plurality of data bytes, each of said data bit cells being represented by a second plurality of data bytes and each of said no bit cells being represented by a third plurality of data bytes, each of said first, second and third plurality of data bytes being stored in a first predetermined number of locations;

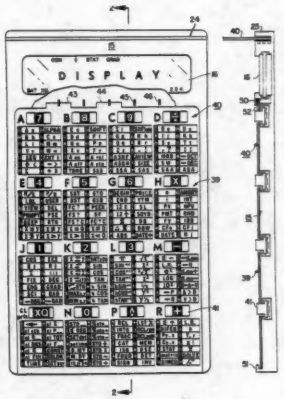
CRT controller means for generating a plurality of sequential data RAM address signals and a plurality of raster signals, said data RAM means having means for receiving each of said plurality of sequential data RAM address signals and generating data byte signals representative of the contents of each addressed location of said data RAM means; and

character generator RAM means coupled to said data RAM means and said CRT controller means for storing a first byte in a first location, a second byte in a second location and a third byte in a third location, and having means for receiving a sequence of said data byte signals and said plurality of raster signals for addressing combinations of the contents of said first, said second and said third locations and having means for generating said stream of data bits at a first bit rate including said clock bit cells, said data bit cells and said no bit cells representative of said data bytes having said fixed format.

4,631,700
MAGNETICALLY CODED SOFTWARE FOR MULTI-PURPOSE COMPUTER

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Continuation-in-part of Ser. No. 460,004, Jan. 21, 1983. This application Aug. 11, 1983, Ser. No. 522,234
Int. Cl.[4] G06F *9/06, 15/08*
U.S. Cl. 364—900 **12 Claims**



1. A software accessory system for a computer data processing system having a coded data strip reading transducer attachment, a manual keyboard with a plurality of keys and internal data processing capabilities of changing operational modes, receiving and storing data and program instructions from either said reading transducer or said keyboard, comprising in combination,

a self supporting keyboard key overlay matrix panel defining a plurality of straight edges and having structure thereon for mating with a set of the keyboard keys to permit manual operation of the keys,

program control means in said computer data processing system activating individual keys to enter a plurality of data and instruction functions greater than the number of keys in response to combinations of more than one keystroke per entry,

graphic indicia on the panel identifying respective individual ones of the keys for indicating a plurality of operational functions attainable by those individual keys by said combinations of keystrokes,

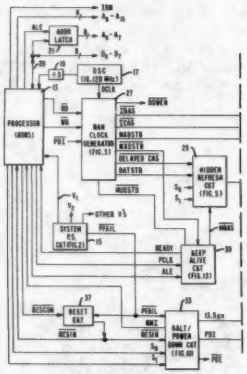
coded data means comprising at least one coded data storage strip disposed along one straight edge of the panel for presenting in coded format for reading data and instructions into the computer data processing system by means of said transducer attachment, software storage means in said computer system for storing data read from the strip

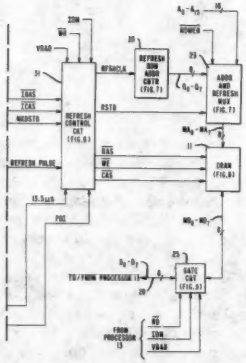
by said transducer for access by the computer data processing system as data and instructions for use in data processing operations and mode selection means responsive to said coded data means on the panel for inplementing an operational mode in the computer data processing system enabling the keys to perform those operational fucntions displayed by the graphic indicia on the panel.

4,631,701
DYNAMIC RANDOM ACCESS MEMORY REFRESH CONTROL SYSTEM

Ronald P. Kappeler, and Robert C. Hughes, both of Dayton, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 31, 1983, Ser. No. 547,523
Int. Cl.[4] G06F *12/16*; G11C *7/00*
U.S. Cl. 364—900 **3 Claims**





1. In a data processing system including a data processor outputting first and second status signals, first and second operating control signals, first clock signals and first memory address signals, a memory system comprising;

a dynamic random access memory coupled to said processor for receiving said first memory address signals;

generator means coupled to said data processor for generating first and second timing signals in response to receiving said first operating control signals;

first gating means coupled to said data processor for outputting an opcode fetch signal in response to receiving said first and second status signals;

a plurality of bistable devices coupled to said generator means and said first gating means for generating a first control signal in response to receiving said opcode fetch signal and said first timing signals;

first logic circuit means coupled to said bistable devices for outputting a first refresh signal in response to the generation of said first control signal;

first multiplexer means coupled to said first logic circuit means, said generator means and said memory for outputting a second refresh signal, an address clock signal and first and second select signals in response to the outputting of said first refresh signal and the generation of said second timing signals to refresh one of a plurality of predetermined portions of said memory identified by the first memory address signals during an opcode fetch cycle of each instruction being executed by said processor;

counter means coupled to said first multiplexer means for developing second memory address signals in response to the outputting of said address clock signal;

second multiplexer means coupled to said counter means, said processor, said generator means and said first multiplexer means for transmitting the second memory address signals to said memory so that at the time of the generation of the next second refresh signal, a refresh operation can be performed on that portion of said memory identified by the second memory address signals in response to the outputting of said first select signal and for selecting address signals from said processor to enable read-write operations to be performed on data in said memory in response to the outputting of said second select signal;

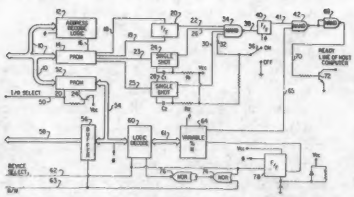
a first one-shot circuit coupled to said processor for outputting a second control signal upon the elapsing of a predetermined time period, said one-shot circuit being disabled from operation, said one-shot circuit being disabled from operation in response to receiving said second operating control signal; and

second logic circuit means coupled to said first logic circuit means, said one-shot circuit and said processor for outputting a plurality of third control signals to said first logic circuit means in response to the outputting of said second control signal and said first clock signals enabling said first logic circuit means to output said first refresh signal to said first multiplexer means whereby the first multiplexer means will output a plurality of said second refresh signals and an associated sequence of address clock signals to the memory causing all of the portions in said memory to be sequentially refreshed upon failure of the processors to start processing before the expiration of said predetermined time period.

4,631,702
COMPUTER SPEED CONTROL

Larry Korba, Ottawa, Canada, assignor to Canadian Patents and Deveopment Limited—Société Canadienne des Brevets et d'Exploitation Limitée, Ottawa, Canada

Filed Feb. 28, 1984, Ser. No. 584,497
Int. Cl.[4] G06F *15/00*
U.S. Cl. 364—900 **6 Claims**



1. A slow down circuit for a digital computer having a microprocessor which has a microprocessor ready line which

enables said microprocessor when impressed with a first logic level voltage and disables the microprocessor when impressed with a second logic level voltage, an address bus, a data bus and a clock pulse generator for producing a clock pulse train, said slow down circuit comprising:

(a) address decode logic means connected to said address bus and said clock pulse generator for producing a clock pulse train when predetermined bit patterns appear on said address bus, said predetermined bit patterns representing special computer functions which require the computer to operate at normal speed;

(b) inhibit signal generating means connected to said address bus and said address decode logic means for producing an inhibit signal when said predetermined bit patterns appear on said address bus and in the presence of said clock pulse train from said address decode logic means;

(c) slow down signal generating means connected to said address bus and said data bus for generating a bi-level signal; and

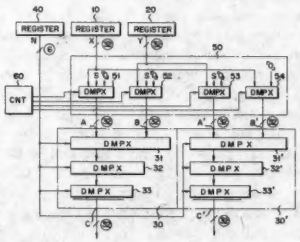
(d) combining means having input terminals connected to said inhibit signal generating means and said slow down signal generating means and an output terminal connected to said microprocessor ready line for combining said inhibit signal and said bi-level signal to produce a control signal; wherein, said control signal has said first and second logic level voltages and wherein said control signal is at said first logic level voltage for enabling said ready line in the presence of said special computer functions and alternately switches between said first logic level voltage and said second logic level voltage in the absence of said special computer functions, said second logic level voltage causing a disabling of said microprocessor to thereby slow down the operation of said microprocessor.

4,631,703

SHIFT CIRCUIT FOR DOUBLE WORD LENGTH DATA

Tsutomu Sakamoto, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 14, 1983, Ser. No. 484,865
Claims priority, application Japan, Apr. 22, 1982, 57-67932
Int. Cl.[4] G06F *7/00*
U.S. Cl. 364—900 **2 Claims**



1. A shift circuit comprising:

a shift number designation register for storing (n+1)-bit shift number information (n: a positive integer) representing the number of shifts;

shift type specifying means for specifying shifting directions and types of arithmetic/logic operations;

first and second data registers for respectively storing the higher 2^n bits and the lower 2^n bits of 2^{n+1}-bit data;

a first data multiplexer, coupled to said first data register and shift type specifying means, for selecting one of the content of said first data register and at least one of a 2^n-bit constant and a 2^n-bit sign, in accordance with the shift type information from said shift type specifying means;

a second data multiplexer, coupled to said second data register and shift type specifying means, for selecting one of the content of said second data register and at least one of a 2^n-bit constant and a 2^n-bit sign, in accordance with the shift type information from said shift type specifying means;

a third data multiplexer, coupled to said second data register and shift type specifying means, for selecting one of the content of said second data register, a 2^n-bit constant and a 2^n-bit sign, in accordance with the shift type information from said type specifying means;

a fourth data multiplexer, coupled to said first data register and shift type specifying means, for selecting one of the content of said first data register and a 2^n-bit constant, in accordance with the shift type information from said shift type specifying means; and

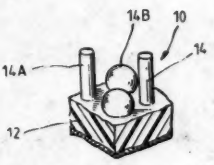
first and second shifters, coupled to said shift number designation register and said first to fourth data multiplexers and having input sections to which 2^n-bit data from said first and second data multiplexers and 2^n-bit data from said third and fourth data multiplexers are respectively supplied, for performing data shifting only in one direction, either to the left or the right, within a shifting range of 0 to 2^n-1 bits in accordance with the shift number information from said shift number designation register, thereby providing a 2^n-bit shift output.

4,631,704

METHODS AND DEVICES FOR CHARGED BEAM ACCESSIBLE DATA STORAGE

Ronald J. Lucas, Columbia; Ivan L. Berry, Ellicott City, both of Md., and John C. Wolfe, Houston, Tex., assignors to The University of Houston, Houston, Tex.

Filed Dec. 15, 1983, Ser. No. 561,747
Int. Cl.[4] G11C *11/46*
U.S. Cl. 365—126 **9 Claims**



1. A method for creating an archival charged beam accessible data storage device comprising the steps of:

forming a storage medium having a base with an array of elongate uniformly spaced, free standing, charged beam absorbing protrusions formed thereon, said protrusions having aspect ratios of at least about three; and

selectively and individually melting certain of said protrusions with a charged beam to form widened protrusions having aspect ratios of less than three.

4,631,705

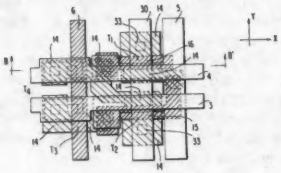
SEMICONDUCTOR INTEGRATED CIRCUIT MEMORY DEVICE

Masahiko Honda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 25, 1984, Ser. No. 624,072
Claims priority, application Japan, Jun. 23, 1983, 58-113133
Int. Cl.[4] G11C *11/34*; H01L *27/04*
U.S. Cl. 365—182 **9 Claims**

7. A semiconductor integrated circuit memory device comprising a plurality of memory cells arranged in one direction in a semiconductor substrate, each memory cell including a plurality of insulated gate type field effect transistors, and a word line including a first word wiring layer made of polycrystalline silicon extending in said one direction and forming each gate electrode of two of said transistors and a second word wiring

layer made of metallic material extending substantially in parallel to said first word wiring layer, said first and second word



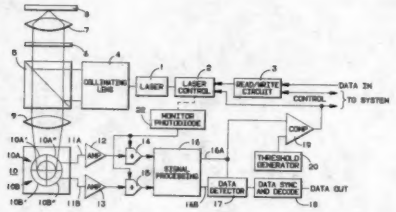
wiring layers being connected with each other at one location for every three or more memory cells.

4,631,706

SYSTEM FOR PREVENTING THE OVERWRITING OF PREVIOUSLY OPTICALLY RECORDED DATA AND FOR READING OPTICALLY RECORDED DATA DURING WRITING

Glenn D. Batalden; Duane W. Baxter, both of Rochester, and Neil R. Davie, Spring Valley, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1984, Ser. No. 672,559
Int. Cl.⁴ G11C *13/00*
U.S. Cl. 365—215 **10 Claims**



1. An optical data storage system having an alterable recording medium, laser means for scanning said alterable recording medium to record data on said medium or read data from said medium, laser control means for driving said laser means at a write state to alter the recording medium and for driving the laster at a read state when reading or not altering the recording medium, and apparatus for preventing the overwriting of data by said laser beam, said apparatus comprising:

radiation detection means responsive to changes in reflected light from said medium as the medium is scanned by said laser beam for generating an output signal representative of data stored at the center of the area scanned by said laser beam;

a portion of said detection means oriented to the relative scanning motion between the laser beam and said medium such that said portion is responsive to changes in reflected light prior to other portions of said detection means as previously recorded data enters the area scanned by the laser beam; said portion generating an anticipatory signal indicating previously recorded data is entering the area scanned by said laser beam;

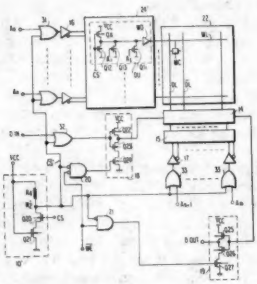
means responsive to said anticipatory signal for inhibiting said laser control means from switching to the write state if previously recorded data is entering the area scanned by the laser beam.

4,631,707

MEMORY CIRCUIT WITH POWER SUPPLY VOLTAGE DETECTION MEANS

Takayuki Watanabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 31, 1983, Ser. No. 528,006
Claims priority, application Japan, Aug. 31, 1982, 57-150844
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—226 **16 Claims**



1. A memory circuit comprising:

a matrix of memory cells,

an operation control terminal said terminal adapted to assume at least a first signal level,

a power voltage terminal, said terminal having a voltage value at least within a normal range or a retention range,

a reference voltage terminal,

means coupled to said matrix and said power voltage terminal for supplying a power voltage to said memory cells,

circuit means operable to read information from and write information into said memory cells, said circuit means being operable when a potential at said power voltage terminal is within normal voltage range,

a detection means including a series connection of an impedance element and first and second field effect transistors coupled between said power voltage terminal and said reference voltage terminal, a gate of said first transistor being coupled to said operation control terminal, a gate of said second transistor being coupled to said power voltage terminal, said first transistor conducting when said operation control terminal assumes a first signal level, said second transistor assuming a conducting state when a potential at said power voltage terminal is within said normal voltage range and a non-conducting state when a potential at said power voltage terminal is outside said normal voltage range, said detection means generating a detection signal ohly when both of said first and second transistors assume conducting states simultaneously, and

means coupled to said detection means and to said circuit means for enabling said circuit means in response to said detection signal.

4,631,708

TRANSMITTER/RESPONDER SYSTEMS

David H. Wood, Stoke Poges, and Martin Creswick, Flackwell Heath, both of England, assignors to Senelco Limited, United Kingdom

Continuation of Ser. No. 450,152, Dec. 15, 1982. This application Feb. 18, 1986, Ser. No. 830,913
Claims priority, application United Kingdom, Dec. 18, 1981, 8138270
Int. Cl.⁴ H04B *1/59;* G01S *9/56, 13/74;* H04Q *5/22*
U.S. Cl. 367—2 **16 Claims**

1. A responder comprising:

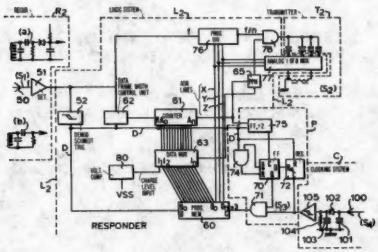
(a) receiver means for receiving a transmitted signal S1 comprising a frequency f1;

(b) generator means for generating a carrier frequency f2 of a carrier component of a transmittable signal S2 comprising carrier frequency f2 and code;

(c) logic means for enabling frequency f2 to be in mathematical relationship wherein f1 is related to f2 by a function of at least one variable having a value other than zero and one with signal S1, said logic means comprising;

(i) at least one memory means, adapted to be programmed for storing code,

(ii) at least one modulation means for modulating said carrier component of signal S2, the modulation being under control of at least a portion of said stored code,



such that said frequency F2, will be encoded to provide said mathematical relationship with said frequency f1 and,

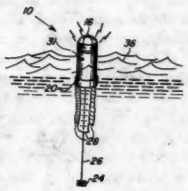
(iii) at least one clock means for providing at least one clocking signal for controlling access of at least a portion of said stored code to said at least one modulation means; and wherein means are provided whereby said at least one memory means is adapted to be programmed with said code by receiving at least one programming signal to be provided by an electromagnetic linkage between said responder and at least one source of said at least one programming signal, said at least one programming signal comprising code to be routed to said at least one memory means so as to provide said stored code.

4,631,709

LOW COST SONOBUOY

Roland A. Bender, 538 Norris Dr., Furlong, Pa. 18925; Lawrence R. Howarth, 8020 Colfax St., Philadelphia, Pa. 19136, and Lawrence F. Coar, 329 Juniper St., Warminster, Pa. 18974

Filed Jul. 13, 1984, Ser. No. 630,628
Int. Cl.[4] B63B *22/00*; B64D *19/00*
U.S. Cl. 367—4 **3 Claims**



3. A low cost, air launched sonobuoy suitable for immersion in water, comprising:

a section of plastic pipe;

a first plastic end cap formed to be nonseparably bonded to one end of said plastic pipe section, said first end cap having a tapered face;

a radio antenna formed to be affixed to said first end cap;

a second plastic end cap formed to be nonseparably bonded to the other end of said plastic pipe section, said second end cap having a recess and a central opening;

hydrophone means deployably positioned within the recess of said second end cap;

a plurality of flexible strips, each contiguously and permanently attached at one end around the periphery of said second end cap and formed for trailing from said sonobuoy during descent thereby providing in-air stability;

electrical component means enclosed within said plastic pipe section and operatively connected between said hydrophone means and said radio antenna for processing and transmitting detected acoustic signals; and

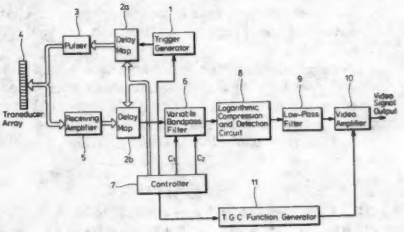
means for orienting said sonobuoy such that said radio antenna is above the water surface and said second end cap is below the water surface.

4,631,710

AZIMUTH ADAPTIVE PHASED ARRAY SONAR

Keiki Yamaguchi; Takao Higashiizumi; Toru Shimazaki; Shinichi Sano, and Yasuhito Takeuchi, all of Tokyo, Japan, assignors to Yokogawa Medical Systems, Limited, Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 591,036
Claims priority, application Japan, Apr. 18, 1983, 58-68231
Int. Cl.[4] G01S *3/80*; G10K *11/34*
U.S. Cl. 367—103 **8 Claims**



1. An azimuth adaptive phased array sonar (see FIG. 3), comprising

a sensor (4) having an array of a plurality of ultrasonic transducer elements (4) which transmit ultrasonic signals and receive echo signals;

a first delay stage (2*a*) which in accordance with a trigger signal supplied from a trigger generator (2) generates a plurality of driving signals having a phase relationship corresponding to the direction of transmission of the ultrasonic beams, respectively;

a pulser (3) for amplifying the driving signals to produce output signals which drive said individual ultrasonic elements (4);

an amplifier (5) for amplifying the echo signals detected by said individual ultrasonic transducer elements (4), respectively;

a second delay stage (2*b*) for delaying the respective output signals of said amplifier (5) for achieving a phase relationship corresponding to the direction of reception of the echo signal;

control means (7) for controlling the phase relationship in said first delay stage (2*a*) and said second delay stage (2*b*) in accordance with the respective direction of transmission of the ultrasonic signals and directions of reception of the echo signals;

a bandpass filter (6) disposed in a signal path of received echo signals and/or in a signal path of producing ultrasonic signals, said bandpass filter (6) having a variable frequency response; and

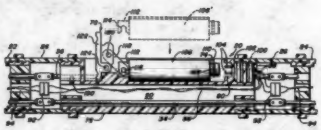
wherein said control means (7) further controls said band-pass filter (6) so as to substantially shift the pass band toward a lower frequency side as the azimuth of the ultrasonic beam is increased.

4,631,711

SYSTEM FOR REMOVABLY HOUSING AND ALIGNING COMPONENTS IN A TOWED ARRAY

John T. Fowler, Marblehead, Mass., assignor to The Laitram Corporation, New Orleans, La.

Filed Nov. 24, 1982, Ser. No. 444,073
Int. Cl.[4] G01V *1/38*; H04R *1/44*
U.S. Cl. 367—149 **41 Claims**



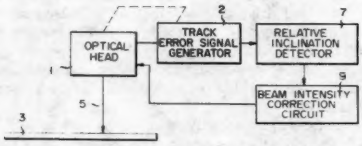
1. In combination:
a streamer section;
an adapter module coupled to at least one portion of said section and having an exterior surface faired with the exterior surface of said streamer section, said module having a breech and at least one strain member channel running therethrough;
at least one strain member in said strain member channel and means for clamping said strain member in said channel to said module;
a cartridge adapted to be removably mounted in said breech, said cartridge having a surface which is faired to the exterior surface of said module adjacent said breech when said cartridge is mounted in said breech; and
means for removably locking said cartridge in said breech.

4,631,712

OPTICAL DISK APPARATUS WITH BEAM ENERGY CORRECTION FOR DEVIATIONS IN INCLINATION

Nobuhide Matsubayashi; Hideyuki Kenjyo; Kiichi Kato, and Masaharu Sakamoto, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 5, 1984, Ser. No. 627,764
Claims priority, application Japan, Jul. 14, 1983, 58-128433
Int. Cl.[4] G11B *7/125*
U.S. Cl. 369—44 **13 Claims**



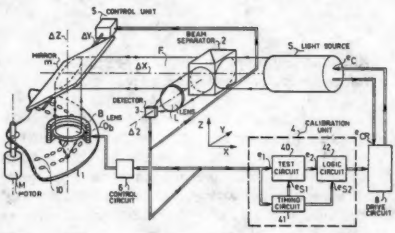
1. An optical disk apparatus, comprising:
an optical head for radiating a light beam onto a recording medium and for forming pits in said recording medium so as to record a signal;
detecting means for detecting a relative inclination between the light beam radiated from said optical head and a given direction relative to the radiated surface portion of said recording medium, and for generating a signal corresponding to an angle of the relative inclination; and
correcting means coupled to said detecting means for receiving the signal corresponding to the angle of the relative inclination from said detecting means, and for increasing the energy of the light beam in proportion to the relative inclination to form pits of a predetermined length in said recording medium.

4,631,713

CALIBRATION DEVICE OF THE OPTICAL POWER APPLIED TO AN OPTICAL DISC FOR RECORDING OF DATA

René Romeas, Palaiseau; Claude Bricot, Villejuif, and Jean-Louis Gerard, Les Ulis, all of France, assignors to Thomson-CSF, Paris, France

Filed May 17, 1984, Ser. No. 611,535
Claims priority, application France, May 20, 1983, 83 08425
Int. Cl.[4] G11B *7/125*
U.S. Cl. 369—54 **15 Claims**



1. Device for recording data in an optically detectable form at the surface of a data support comprising a material sensitive to optical radiation, said device comprising means for focusing in said surface an optical beam electrically modulable by an incident electric signal for imparting local modifications of optical characteristics in said surface, means ensuring the exploration of said surface along any one of a plurality of adjacent track elements with a light spot projected by said optical beam, electro-optical reading means the interaction of which with said modifications of optical characteristics produce an electric reading signal and control means allowing to adjust the power of said optical beam in such a way that said electrical reading signal suitably reproduces the temporal distribution of the impulses constituting said incident electric signal, wherein binary test words are recorded in an area of said surface arranged sidely of the area specifically alotted to the storage of said incident electric signal with several staggered power values of said optical beam and wherein the analysis of the portion of said reading signal corresponding to said staggered power values allows to determine which power value is most suitable for recording said incident electric signal in said specifically alotted area; said control means comprising a calibrating circuit associated to a control or drive circuit of the source of said optical beam; said calibrating circuit comprising a memory logic circuit controlling the writing and the reading of said binary test words according to a predetermined cycle and an analysis circuit of the reading signal delivering tested values to said memory logic circuit, in order to assign said power value to said optical beam, prior to the beginning of a recording of said incident electric signal.

4,631,714

APPARATUS FOR FURNISHING DATA SIGNALS FROM AN OPTICALLY READABLE RECORD CARRIER AT THE SAME FREQUENCY AS THE ASSOCIATED SUBCODE SIGNALS

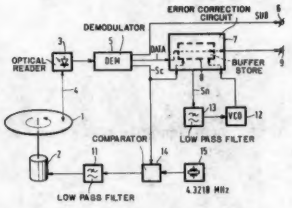
Josephus A. H. M. Kahlman, and Constant P. M. J. Baggen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 17, 1983, Ser. No. 552,639

Claims priority, application Netherlands, Sep. 2, 1983, 8303061

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—59 4 Claims



1. Apparatus for modifying a digital audio player furnishing data signals at a constant rate and subcode signals at a varying channel bit frequency to furnish said data signals at said channel bit frequency, said player having motor means for driving disc-shaped record carrier means, read-out means for reading out said subcode signals and said data signals from said record carrier means at said channel bit frequency, error correction circuit means connected to said read out means and having a buffer storage receiving said data signals at said channel bit frequency, fixed frequency oscillator means external to said error correction circuit means for controlling read-out of said data signals from said buffer storage means at said constant rate, said error correction circuit means further generating an error signal corresponding to deviations of said channel bit frequency from said constant frequency, said apparatus comprising

voltage controlled oscillator means for generating a control signal for controlling said readout of said data signals from said buffer storage means and applying said control signal to said buffer storage means; and

means connected to said voltage controlled oscillator means for applying said error signal to said voltage controlled oscillator means so that said frequency of said voltage controlled oscillator means varies in accordance with said error signal and therefore in accordance with said channel bit frequency.

4,631,715

AUDIO STRAW AND CUP LID

Lawrence E. Hoover, 8625 W. Vernor, Detroit, Mich. 48209

Filed May 6, 1985, Ser. No. 731,049

Int. Cl.[4] G11B *1/04, 3/00, 7/24;* A47G *21/18*

U.S. Cl. 369—68 4 Claims

1. The combination of a cup lid having a pair of cross-slits for allowing passage therethrough of a drinking straw, said cup lid being made of substantially thin resilient material, said drinking straw having at least one longitudinal linear soundtrack embossed on its surface, said soundtrack consisting of a series of embossed crests and valleys according to a specific audio modulation, said cross-slits on said lid forming a plurality of substantially triangular flaps having adjoining tips, one of said flaps having a stylus-like projection having a sharp apex formed at the tip of said one of said flaps for engagement with said soundtrack when said drinking straw is pushed through said cross-slits causing said one of said flaps having said stylus-like projection to bend and thereby engage the apex of said stylus-like projection with said soundtrack, whereby said lid is set in vibration for emitting a sound corresponding to said soundtrack on said drinking straw, wherein said drinking straw has a plurality of longitudinal linear soundtracks and means at

the tip of the flaps other than said one of said flaps provided with said stylus-like projection preventing engagement of the tip of said other flaps with said soundtracks.

4,631,716

OPERATION CHANGEOVER MECHANISM

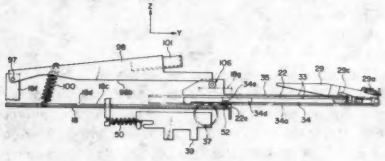
Yuji Ikedo, and Masao Kase, both of Saitama, Japan, assignors to Pioneer Electronic Corp., Tokyo, Japan

Filed Feb. 19, 1985, Ser. No. 702,767

Claims priority, application Japan, Feb. 17, 1984, 59-29308; Feb. 28, 1984, 59-29787[U]

Int. Cl.[4] G11B *1/00, 25/04*

U.S. Cl. 369—75.2 8 Claims



1. In a front loading recorded disk playing apparatus having a housing with an opening in a front panel, a chassis within said housing on which operational electrical apparatus and mechanical apparatus are mounted, a record carrying means for supporting a record disk, said record carrying means being adapted to move between a first position within said housing and a second position extended from said housing, said record carrying means being mounted to said chassis by an extendable track apparatus which is adapted to support said record carrying means in its first position and its second position, the improvement comprising:

a stationary base means, said stationary base means being mounted on and stationary with respect to said chassis in a first planar direction, said stationary base further comprising a first rail means integrally formed with said base means and aligned in the direction of movement of said record carrying means between its first and second positions, said first rail means further including a first recess means;

an extendable rail means, said extendable rail means having a second rail means aligned in the direction of movement of said record carrying means between its first and second positions, said second rail means further including a second recess means;

a moveable base means, said moveable base means forming a part of said record carrying means and being at least partly disposed between the first rail means and the second rail means and said moveable base means being adapted for slidable movement relative to said first and second rail means as said record carrying means moves

between its first and second positions, said moveable base further including an opening therein;

a detent means, said detent means being contained within the opening in said moveable base means;

said first recess of said first rail means, said second recess of said second rail means and said opening of said moveable base means being in alignment when said record carrying means is in said first position and said first and second recess means being adapted to resistively contain said detent means whereby said moveable base means is locked with respect to said said second rail means and relative movement between said moveable base means and said first rail means is allowed until said record carrying means arrives at said first position, and after said arrival of said record carrying means at said first position, relative movement between said second rail means and said moveable base means is allowed and said moveable base means is locked with respect to said first rail means.

4,631,717

HIGH DENSITY INFORMATION RECORDS OF AN ELECTROSTATIC CAPACITANCE TYPE

Kazuhira Namikawa; Toshiaki Hamaguchi; Mutsuaki Nakamura; Akio Kuroda, all of Yokohama; Akio Hata, and Noriki Fujii, both of Shinnanyo, all of Japan, assignors to Victor Company of Japan, Ltd. and Tokuyama Sekisui Industry Corporation, Limited, both of, Japan

Filed Nov. 26, 1984, Ser. No. 675,014

Claims priority, application Japan, Nov. 26, 1983, 58-221426

Int. Cl.[4] G08K *3/04*; G11B *5/00*

U.S. Cl. 369—276 **8 Claims**

1. In a high density information record of the electrostatic capacitance type which comprises a record substrate on which signal information is recorded as geometric variations and which is made of a conductive resin composition comprising 100 parts by weight of a graft polymer between a copolymer of ethylene and vinyl acetate and monomeric vinyl chloride in a ratio by weight of 1 to 10:99 to 90, which copolymer has a content of vinyl acetate not less than 35 wt%, and 5 to 30 parts by weight of a conductive powder and 0.5 to 5 parts by weight of a lubricant dispersed in said graft polymer, the improvement wherein said copolymer is obtained by solution polymerization and has a melt index not larger than 20 and said lubricant is an ester between a fatty acid and an alcohol having a hydroxyl value not larger than 15.

4,631,718

METHOD AND DEVICE FOR SYNCHRONIZATION OF SYSTEM TIMING

Fumio Miyao, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

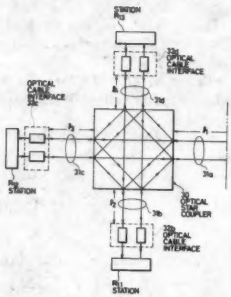
Filed Jan. 7, 1985, Ser. No. 689,381

Claims priority, application Japan, Jan. 20, 1984, 59-7344

Int. Cl.[4] H04B *9/00*

U.S. Cl. 370—4 **7 Claims**

1. In a multistation communication network for effecting time-sharing multiplex transmission and reception of digital signals in a form of packets by use of optical cables, a method for synchronization of system timing, which comprises putting up a flag identifying a signal from a master station only in a packet signal issued from a personal station which has acquired priority in system timing, determining front guard time for packet signals of individual personal stations by an arithmetic processing using distances from an optical star coupler located at a middle of said communication network to said individual personal stations and a predetermined guard time representative of the guard time needed for a signal originating at the position of said optical star coupler, clocking said front guard time starting from trailing ends of the packet signals of said master station received by said individual personal stations,



and establishing system timing based on times at which said clocking is completed.

4,631,719

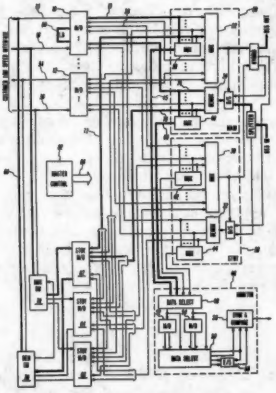
CHANNEL LOOPING APPARATUS FOR FAILURE ANALYSIS

Charles E. Huffman, Plano, and Paul E. Pepmiller, Richardson, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 13, 1984, Ser. No. 599,872

Int. Cl.[4] H04J *1/16, 3/14*

U.S. Cl. 370—15 **7 Claims**



1. The method of checking the operability of a muldem (multiplex-demultiplex) unit comprising the steps of:

supplying customer input data simultaneously both to a muldem to be tested for operability and to a further operational muldem for uninterrupted customer input data transmission during testing;

looping back output signals from one-half of said muldem to an input of the other half of said muldem such that identical data is being multiplexed and demultiplexed by the muldem being tested; and

comparing, after loopback, a predetermined number of data bits input to and output from the muldem being tested on a bit by bit basis for identical values as a check for operability of said muldem.

4,631,720

SERVICE INTEGRATED TRANSMISSION SYSTEM

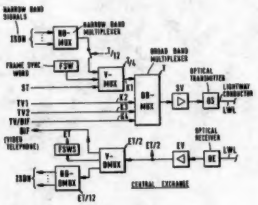
Klaus Koeck, Backnang, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 330,453, Dec. 14, 1981, abandoned. This application Oct. 21, 1985, Ser. No. 789,341

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047045

Int. Cl.[4] H04J *3/16*

U.S. Cl. 370—84 9 Claims



1. In a method of transmitting signals of different information rates between a subscriber station and a central exchange in a service integrated transmission system operating in time multiplex and with two-way transmission between the subscriber station and the central exchange, said method including combining the data signals of different information rates to be transmitted at the transmitting end of the system by time multiplexing same, transmitting the time multiplexed signals within a multiplexing bit stream having a clock pulse frequency according to the entire operating information rate, and recovering the original data signals at the receiving end by demultiplexing the received signals; the improvement comprising: selecting a time multplex frame frequency equal to the smallest information rate of the data signals to be transmitted; transmitting one information unit of a data signal having the smallest information rate per frame; and, causing said step of combining at said central station to include: providing each transmitting frame, and hence the receiving frame at the subscriber station, with N subframes, each including a head portion and an information portion of respective constant lengths, and with a multibit frame sync word being accommodated in said head portion of each said subframe, said information units of said data signals having the smallest information rate (narrowband signals) being accommodated in said head portions of said subframes, the data signals of larger information rate being accommodated in said information portion of each said subframe, each subframe being subdivided into z time slots each accommodating only one information unit of said signals being transmitted, and successive said time slots being associated with different ones of said data signals.

4,631,721

BIDIRECTIONAL COMMUNICATION SYSTEM OF A TWO-WIRE BUS COMPRISING AN ACTIVE TERMINATOR

Tatsuhiro Ono; Shin'ichi Koike; Haruhiko Tsuchiya, all of Tokyo, and Yuji Inoue, Kanagawa, all of Japan, assignors to NEC Corporation and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed Aug. 15, 1984, Ser. No. 640,917

Claims priority, application Japan, Aug. 16, 1983, 58-149339

Int. Cl.[4] H04J *3/02, 3/06*

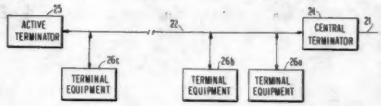
U.S. Cl. 370—85 6 Claims

1. In a bidirectional communication system for use in carrying out bidirectional communication in a time division fashion through a two-wire bus having a first and a second end, said system comprising a central terminator connected to said first end and an active terminator connected to said second end, said central terminator being for transmitting a down burst from said first end towards said second end and for receiving an up burst transmitted from said second end towards said first end, said down and said up bursts including a down and an up synchronization signal, respectively, the improvement wherein:

each of said down and said up bursts is encoded by the use of the Manchester codes with each of said down and said up synchronization signals having a code pattern formed by a positive violation code "V_+", a code "1", and a negative violation code "V_-" of said Manchester codes;

said active terminator comprising:

synchronization signal deriving means responsive to said down burst for deriving said code pattern from said down



burst to detect said down synchronization signal and to establish synchronization of said active terminator with reference to said down synchronization signal; and

synchronization signal delivering means coupled to said synchronization signal deriving means for delivering said up synchronization signal in relation to said down synchronization signal towards said first end; and

said system further comprising:

at least one terminal equipment intermediate between said first and said second ends for carrying out reception of said down burst in response to said down synchronization signal so as to form said up burst in response to said up synchronization signal.

4,631,722

ELECTRONIC CONTROLLER FOR CYCLICALLY OPERATING MACHINERY

Thomas Voss, Tettnang, Fed. Rep. of Germany, assignor to ZF-Herion-Systemtechnik GmbH, Friedrichshafe, Fed. Rep. of Germany

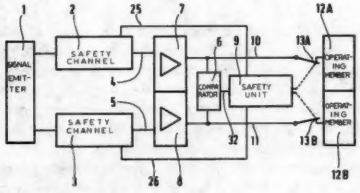
PCT No. PCT/EP83/00030, § 371 Date Oct. 11, 1983, § 102(e) Date Oct. 11, 1983, PCT Pub. No. WO83/02816, PCT Pub. Date Aug. 18, 1983

PCT Filed Feb. 4, 1983, Ser. No. 562,580

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3204709

Int. Cl.[4] G06F *11/00, 7/34;* G05B *15/08, 9/02*

U.S. Cl. 371—9 6 Claims



1. An electronic controller for a cyclically operating mechanical device comprising:

two safety channels of different circuit construction, simultaneously having identical control functions and acting upon respectively associated operating members, of which a first of said safety channels is constructed with hard-wired switching logic and a second of such safety channels with microcomputer circuitry, including at least a microprocessor having a control program and a check

program, said check program effecting a self-check of all components of said second safety channel, said channels having respective output signals;

a common safety stage connected to both channels, which upon the occurrence of unequal output signals of the two safety channels places the device in a safe state;

a self-check facility, different from said self-check of said second channel for effecting self-check of the first safety channel, the self-checks of said channels being effected periodically within the cycle periods; and

amplifiers connected to the outputs of the safety channels and having output signals applied to a comparator for monitoring equality and synchronism of said two safety channels, said comparator having an output signal, the output signal of the comparator and output signals of the self-check facilities acting upon said common safety stage.

4,631,723

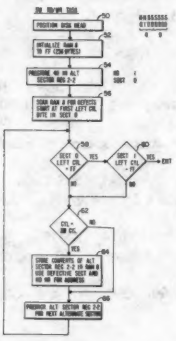
MASS STORAGE DISK DRIVE DEFECTIVE MEDIA HANDLING

Donald J. Rathbun, Andover; Bruce H. Tarbox, Billerica, both of Mass., and Taian Su, Palo Alto, Calif., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jun. 8, 1984, Ser. No. 618,640

Int. Cl.[4] G06F *11/20*

U.S. Cl. 371—10 **4 Claims**



1. A method in a mass storage disk device of addressing a sector on the surface of a disk and selecting an alternate sector if said sector was previously recorded as being a defective sector, the method comprising the steps of:

(a) prestoring a predetermined number in a register;

(b) storing an address of each defective sector in a first area of a random access memory (RAM);

(c) comparing in turn each cylinder number portion of said address stored in said RAM with a cylinder number of said sector on said disk being addressed;

(d) incrementing said register after each comparison test; and

(e) writing the contents of said register in a second area of said RAM during each equal comparison at a location specified by each head and sector number portion of said address, said contents of said register being indicative of an alternate sector number and an alternate head number of a predetermined cylinder on which is stored said alternate sector.

4,631,724

SEMICONDUCTOR MEMORY TEST EQUIPMENT

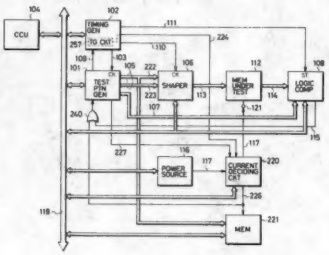
Masao Shimizu, Gyoda, Japan, assignor to Advantest Corp., Tokyo, Japan

Filed May 15, 1985, Ser. No. 734,109

Claims priority, application Japan, May 23, 1984, 59-103882

Int. Cl.[4] G01R *31/28*

U.S. Cl. 371—21 **7 Claims**



1. Semiconductor memory test equipment comprising:

a timing generator for generating an operating clock of a set period and an output timing signal of a phase set relative to the operating clock;

a test pattern generator supplied with the operating clock, for generating addresses and applying them to a memory under test with the period of the operating clock;

a power source circuit for supplying a power source current necessary for operation of the memory under test; and

a current value deciding circuit including

a current value detecting means for detecting the value of the power source current being supplied to the memory under test,

a deciding means for deciding, by comparison, whether the detected current value is greater than a predetermined value, and

an output means responsive to the output timing signal from the timing generator to output the decision result from the deciding means at the timing of the output timing signal.

4,631,725

ERROR CORRECTING AND DETECTING SYSTEM

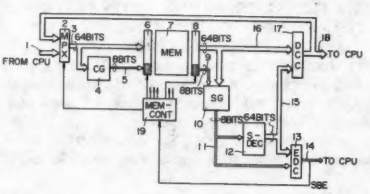
Moriyuki Takamura, Yokohama; Shigeru Mukasa, Machida, and Takashi Ibi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 27, 1984, Ser. No. 686,815

Claims priority, application Japan, Dec. 28, 1983, 58-250004

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—39 **8 Claims**



1. A error correcting and detecting system comprising means (4) for producing 8 redundancy bits from 64 data bits in accordance with the following parity-check H-matrix (100) formed by 18 vector blocks, each vector block comprising 4 column vectors

$$\begin{pmatrix} i^{A}1j \\ i^{A}2j \\ i^{A}3j \\ . \\ . \\ . \\ i^{A}8j \end{pmatrix}$$

where each element is 0 or 1;

$i = 1, 2, \ldots, 18$; and $j = 1, 2, 3, 4$; then

$$H = \qquad (100)$$

$$\begin{array}{cccccccc} \overbrace{}^{\text{BLOCK 1}} & & & & \overbrace{}^{\text{BLOCK 2}} & & & \overbrace{}^{\text{BLOCK 18}} \\ \begin{pmatrix} 1^{A}11 & 1^{A}12 & 1^{A}13 & 1^{A}14 \\ 1^{A}21 & 1^{A}22 & 1^{A}23 & 1^{A}24 \\ 1^{A}31 & 1^{A}32 & 1^{A}33 & 1^{A}34 \\ . & . & . & . \\ . & . & . & . \\ . & . & . & . \\ 1^{A}81 & 1^{A}82 & 1^{A}83 & 1^{A}84 \end{pmatrix} & \begin{pmatrix} 2^{A}11 & 2^{A}12 & 2^{A}13 & 2^{A}14 \\ 2^{A}21 & 2^{A}22 & 2^{A}23 & 2^{A}24 \\ 2^{A}31 & 2^{A}32 & 2^{A}33 & 2^{A}34 \\ . & . & . & . \\ . & . & . & . \\ . & . & . & . \\ 2^{A}81 & 2^{A}82 & 2^{A}83 & 2^{A}84 \end{pmatrix} & \ldots & \begin{pmatrix} 18^{A}11 & 18^{A}12 & 18^{A}13 & 18^{A}14 \\ 18^{A}21 & 18^{A}22 & 18^{A}23 & 18^{A}24 \\ 18^{A}31 & 18^{A}32 & 18^{A}33 & 18^{A}34 \\ . & . & . & . \\ . & . & . & . \\ . & . & . & . \\ 18^{A}81 & 18^{A}82 & 18^{A}83 & 18^{A}84 \end{pmatrix} \end{array}$$

wherein

(i) there are no all "0" vector;

(ii) all column vectors are different from each other;

(iii) 8 column vectors each having only one "1" are included therein;

(iv) each column vector has an odd number of "1's";

(V) the modulo-2 sum h_A of any three column vectors within any block never equals any column vectors of the H-matrix (100), i.e.,

$$h_A = \begin{pmatrix} i^{A}1k \\ i^{A}2k \\ i^{A}3k \\ . \\ . \\ . \\ i^{A}8k \end{pmatrix} \oplus \begin{pmatrix} i^{A}1l \\ i^{A}2l \\ i^{A}3l \\ . \\ . \\ . \\ i^{A}8l \end{pmatrix} \oplus \begin{pmatrix} i^{A}1m \\ i^{A}2m \\ i^{A}3m \\ . \\ . \\ . \\ i^{A}8m \end{pmatrix}$$

$$= \begin{pmatrix} i^{A}1k \oplus i^{A}1l \oplus i^{A}1m \\ i^{A}2k \oplus i^{A}2l \oplus i^{A}2m \\ i^{A}3k \oplus i^{A}3l \oplus i^{A}3m \\ . \\ . \\ . \\ i^{A}8k \oplus i^{A}8l \oplus i^{A}8m \end{pmatrix}$$

$$\neq \begin{pmatrix} p^{A}1j \\ p^{A}2j \\ p^{A}3j \\ . \\ . \\ . \\ p^{A}8j \end{pmatrix}$$

where $i=1, 2, \ldots, 18$; $j=1, 2, 3, 4$; $p=1, 2, \ldots, 18$; $(k,l,m)=(2,3,4)\ (1,3,4),\ (1,2,4),\ (1,2,3)$;

(vi) the modulo-2 sum h_B of four column vectors within any block i never equals the all "0" vector, i.e.,

$$h_B = \begin{pmatrix} i^{A}11 \\ i^{A}21 \\ i^{A}31 \\ . \\ . \\ . \\ i^{A}81 \end{pmatrix} \oplus \begin{pmatrix} i^{A}12 \\ i^{A}22 \\ i^{A}32 \\ . \\ . \\ . \\ i^{A}82 \end{pmatrix} \oplus \begin{pmatrix} i^{A}13 \\ i^{A}23 \\ i^{A}33 \\ . \\ . \\ . \\ i^{A}83 \end{pmatrix} \oplus \begin{pmatrix} i^{A}14 \\ i^{A}24 \\ i^{A}34 \\ . \\ . \\ . \\ i^{A}84 \end{pmatrix}$$

$$= \begin{pmatrix} i^{A}11 \oplus i^{A}12 \oplus i^{A}13 \oplus i^{A}14 \\ i^{A}21 \oplus i^{A}22 \oplus i^{A}23 \oplus i^{A}24 \\ i^{A}31 \oplus i^{A}32 \oplus i^{A}33 \oplus i^{A}34 \\ . \\ . \\ . \\ i^{A}81 \oplus i^{A}82 \oplus i^{A}83 \oplus i^{A}84 \end{pmatrix}$$

$$\neq \begin{pmatrix} 0 \\ 0 \\ 0 \\ . \\ . \\ . \\ 0 \end{pmatrix}$$

where $i=1, 2, \ldots, 18$;

(vii) the modulo-2 sum of eight column vectors within any two blocks p and q never equals the all "0" vector, i.e.,

$$h_C = \begin{pmatrix} p^{A}11 \\ p^{A}21 \\ p^{A}31 \\ . \\ . \\ . \\ p^{A}81 \end{pmatrix} \oplus \begin{pmatrix} p^{A}12 \\ p^{A}22 \\ p^{A}32 \\ . \\ . \\ . \\ p^{A}82 \end{pmatrix} \oplus \begin{pmatrix} p^{A}13 \\ p^{A}23 \\ p^{A}33 \\ . \\ . \\ . \\ p^{A}83 \end{pmatrix} \oplus \begin{pmatrix} p^{A}14 \\ p^{A}24 \\ p^{A}34 \\ . \\ . \\ . \\ p^{A}84 \end{pmatrix}$$

$$= \begin{pmatrix} q^{A}11 \\ q^{A}21 \\ q^{A}31 \\ . \\ . \\ . \\ q^{A}81 \end{pmatrix} \oplus \begin{pmatrix} q^{A}12 \\ q^{A}22 \\ q^{A}32 \\ . \\ . \\ . \\ q^{A}82 \end{pmatrix} \oplus \begin{pmatrix} q^{A}13 \\ q^{A}23 \\ q^{A}33 \\ . \\ . \\ . \\ q^{A}83 \end{pmatrix} \oplus \begin{pmatrix} q^{A}14 \\ q^{A}24 \\ q^{A}34 \\ . \\ . \\ . \\ q^{A}84 \end{pmatrix}$$

$$= \begin{pmatrix} p^{A}11 \oplus p^{A}12 \oplus p^{A}13 \oplus p^{A}14 \oplus q^{A}11 \oplus q^{A}12 \oplus q^{A}13 \oplus q^{A}14 \\ p^{A}21 \oplus p^{A}22 \oplus p^{A}23 \oplus p^{A}24 \oplus q^{A}21 \oplus q^{A}22 \oplus q^{A}23 \oplus q^{A}24 \\ p^{A}31 \oplus p^{A}32 \oplus p^{A}33 \oplus p^{A}34 \oplus q^{A}31 \oplus q^{A}32 \oplus q^{A}33 \oplus q^{A}34 \\ . \\ . \\ . \\ p^{A}81 \oplus p^{A}82 \oplus p^{A}83 \oplus p^{A}84 \oplus q^{A}81 \oplus q^{A}82 \oplus q^{A}83 \oplus q^{A}84 \end{pmatrix}$$

$$\neq \begin{pmatrix} 0 \\ 0 \\ 0 \\ . \\ . \\ . \\ 0 \end{pmatrix}$$

where $p, q=1, 2, \ldots, 18$; $p \neq q$;

said system further comprising:

a memory unit (7);

write means (6, 19) for writing a 72-bit codeword formed by said 8 redundancy bits and 64 data bits into said memory unit (7);

read means (8, 19) for reading said 72-bit codeword from said memory unit (7);

means (10) for producing 8 syndrome bits (S0 to S7)

from said 72-bit codeword in accordance with the H-matrix (100);

means (12) for decoding said 8 syndrome bits (S0 to S7) to produce a 72-bit error bit signal (EB01 to EB64, EBC0 to EBC7) showing the location of a single-bit error;

means (17) for correcting a single-bit error of said data bits (MRD01 to 64) read by said read means (8, 19) with said 64-bit error bit signal; and

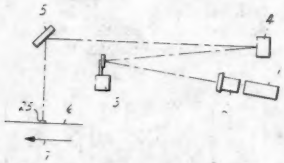
means (13) for determining the existence of a double-bit error, a triple-bit error within one block, a quadruple-bit error within one block, and an 8-bit burst error within two blocks by the logical operation of said error bit signal (EB01 to EB64, EBC0 to EBC7) and said 8 syndrome bits (S0 to S7).

4,631,726

LASER DIODE CONTROL CIRCUITRY

David J. Schoon, North Branch, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 28, 1983, Ser. No. 470,489
Int. Cl.[4] H01S 3/13
U.S. Cl. 372—31 1 Claim



1. A control circuitry for a laser diode adapted to direct its light output to a resonant scanning mirror having a velocity that varies sinusoidally, the circuit comprising:

means for providing a bias current for the laser diode that is in excess of a laser threshold current and is applied directly to the laser diode, and

means resistively coupled to the laser diode providing a signal directly to the laser diode for changing the current through the laser diode, said signal varying inversely proportional to the velocity of the resonant scanning mirror;

means resistively coupled to the laser diode for receiving digital signals for providing a signal directly to the laser diode for one state of the digital signal which reduces the current through the laser diode below the laser threshold current; and

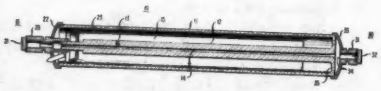
means for inhibiting operation of the second-mentioned means and the last-mentioned means for a portion of the movement of the scanning mirror.

4,631,727

COLD CATHODE GAS TUBES

Dale E. Crane, Sunnyvale, Calif.; Robert E. Jones, Lesington, Mo.; Mathew D. Watson, Sunnyvale, Calif., and Alan D. White, Berkeley Heights, N.J., assignors to UNIPHASE Corporation, Sunnyvale, Calif.

Filed Apr. 18, 1985, Ser. No. 724,583
Int. Cl.[4] H01S 3/00
U.S. Cl. 372—33 10 Claims



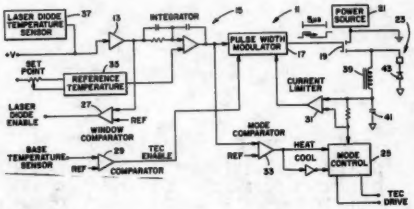
1. In a cold cathode gas tube comprising an anode and a cathode, the improvement including an electric field concentrator located in the region between said anode and said cathode.

4,631,728

THERMOELECTRIC COOLER CONTROL CIRCUIT

Brent S. Simons, Santa Clara, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 22, 1985, Ser. No. 757,397
Int. Cl.[4] H01S 3/00
U.S. Cl. 372—38 5 Claims



1. A thermoelectric cooler control circuit for a laser diode that has its temperature regulated by a thermoelectric cooler and its temperature sensed by a laser diode temperature sensor including:

(a) an amplifier, an integrator, a pulse width modulator, a reference voltage generator, a power source, a switching transistor, a filter network and a mode controller;

(b) the output of said laser diode temperature sensor being applied to the input of said amplifier, the output of said amplifier being applied to a first input of said integrator, the output of said reference voltage generator being applied to a second input of said integrator, the output of said integrator being applied to a first input of said pulse width modulator, the output of said pulse width modulator being applied to the base of said transistor, the output of said power source being passed through said transistor to the input of said filter network, the output of said filter network being connected to the input of said mode controller, the output of said mode controller being connected to the power input of said thermoelectric cooler; whereby

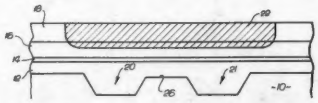
(c) the voltage output of said reference voltage generator is selected to establish a preselected laser diode temperature and said integrator provides an output signal to said pulse width modulator and to said mode controller to apply power to said thermoelectric cooler to maintain said laser diode at a constant temperature.

4,631,729

SEMICONDUCTOR LASER STRUCTURE

Frank E. Goodwin, Marina Del Rey; Hsiang-Yi D. Law, Agoura; Charles B. Morrison, and Luis Figueroa, both of Torrance, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 1, 1983, Ser. No. 556,879
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—44 24 Claims



1. A semiconductor laser structure, comprising:

an active semiconductor layer;

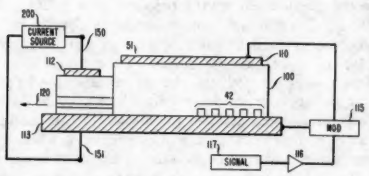
means defining at least two principal lasing regions laterally spaced in said active layer, said means including at least two parallel lasing channels formed under said active semiconductor layer, to confine the lasing action to the principal lasing regions located adjacent to the channels, and wherein the two principal lasing regions are configured to produce different sets of longitudinal modes of output; and

means for defining an intermediate coupling region between the principal lasing regions, to provide close coupling between the two principal lasing regions, resulting in a composite output from the structure that includes longitudinal modes common to both principal lasing regions, whereby said structure can be easily designed to operate in a single desired longitudinal mode.

4,631,730
LOW NOISE INJECTION LASER STRUCTURE

Stewart E. Miller, Middletown Township, Monmouth County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Sep. 28, 1984, Ser. No. 655,258
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—50 **17 Claims**



1. An injection laser comprising:

an active laser region having a first end and a second end, the first end being a partial reflector of laser radiation generated in the active laser region,

means for injection pumping the active laser region to produce the laser radiation, and

a passive waveguide region having a first end and a second end, the first end being a partial reflector of the laser radiation, and wherein the active laser region and the passive waveguide region are joined to one another at the second ends of each one to form a laser cavity between the respective first ends of the active laser and the passive waveguide regions; and wherein the passive waveguide region has an index of refraction which is substantially equal to the index of refraction of the active region and is substantially loss and reflection free and frequency nonselective for a length which is at least as great as the length of the active laser region.

4,631,731
DEVICE FOR PRODUCING OR AMPLIFYING COHERENT RADIATION

Joachim H. Wolter, and Robert E. Horstman, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

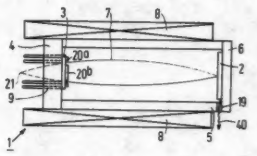
Filed Feb. 3, 1984, Ser. No. 576,974
Claims priority, application Netherlands, Feb. 21, 1983, 8300631
Int. Cl.⁴ H01S *3/09*
U.S. Cl. 372—74 **10 Claims**

1. A device having a coherent electromagnetic radiation output, which comprises:

a first body having a first layer for generating said electromagnetic radiation output;

an active region in said first layer, in which, in the operating state, population inversion is obtained by electron injection; and

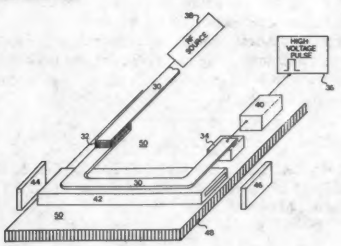
a semiconductor device having semiconductor cathode means for generating a beam of electrons in said operating state for injection into said active region, said semiconductor cathode means comprising a semiconductor body having a p-type region and an n-type region which adjoins a surface of the semiconductor body, said p-type and n-type regions forming a p-n junction, whereby, when a voltage is applied in the reverse direction across said p-n junction in the semiconductor body, electrons are produced by avalanche multiplication, which electrons emanate from the semiconductor body, said p-n junction having a portion extending at least locally substantially parallel to the surface and having a lower breakdown voltage at said portion than at the remaining part of said p-n junction, said portion having the lower breakdown voltage being separated from the surface by a portion of said n-type region forming a conducting layer having a thickness and doping concentration such that at the breakdown voltage the depletion zone of the p-n junction does not extend to the surface, but remains separated therefrom by a surface layer which is sufficiently thin to pass said electrons.



4,631,732
HIGH FREQUENCY RF DISCHARGE LASER

Clad P. Christensen, 2233, Arlington Ter., Alexandria, Va. 22303

Filed Apr. 25, 1984, Ser. No. 603,846
Int. Cl.⁴ H01S *3/097*
U.S. Cl. 372—87 **26 Claims**



1. A high frequency high power stabilized RF discharge laser comprising in combination;

a ground plane;

a stripline waveguide electrode having first and second ends located in a plane substantially parallel to said ground plane;

an RF souce connected to said first end of said stripline waveguide electrode by a means for preventing a high voltage pulse from damaging said RF source;

a discharge tube located between said ground plane and said stripline waveguide electrode;

preionization pulse means including a high voltage source

applying a high voltage pulse to said second end of said stripline waveguide electrode and a means placed between said high voltage pulse source and said stripline waveguide electrode for preventing said RF from damaging said high voltage source; and

a waveguide region formed by said ground plane and said stripline waveguide electrode wherein said discharge tube lies within said waveguide region.

4,631,733

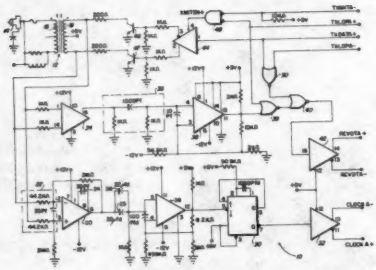
TRANSCEIVER

Robert L. Spiesman, Phoenix, Ariz., assignor to Honeywell Inc., Phoenix, Ariz.

Filed Dec. 17, 1984, Ser. No. 682,521

Int. Cl.[4] H04L *27/18, 7/06, 1/24*

U.S. Cl. 375—7 **5 Claims**



1. A transceiver for applying substantially square wave data signals having a first frequency to a coaxial cable and of receiving data signals carried by the coaxial cable and quasi-sinusoidal timing signals having a second frequency, which data and timing signals are carried concurrently by the coaxial cable, comprising:

a coupling transformer having a transmission line winding and a transceiver winding;

transmitter means connected to the transceiver winding for inducing a voltage across the transmission line winding to apply data signals to the coaxial cable;

first receiver means connected to the transceiver winding for receiving and reshaping data signals present in voltage across the transceiver winding; and

second receiver means connected to the transceiver winding for receiving, amplifying and reshaping the quasi-sinusoidal timing signals into substantially square wave signals of the second frequency.

4,631,734

CROSS-POLARIZATION CANCELER/EQUALIZER

Gerard J. Foschini, Sayreville, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 21, 1985, Ser. No. 714,441

Int. Cl.[4] H03H *7/30*

U.S. Cl. 375—15 **4 Claims**

1. A cross-polarization equalizer/canceler for concurrently equalizing and canceling cross-polarization components in a first and a second orthogonally polarized digital signal, the equalizer/canceler comprising:

a first and second input terminals for receiving the first and second orthogonally polarized signal, respectively;

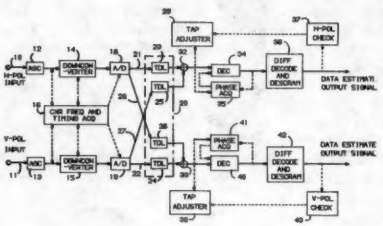
a first and a second straight-through path (21,22) coupled to the first and second input terminal, respectively;

a tapped delay line matrix (20) comprising a separate tapped delay line (TDL) in each of the first and second straight-through paths and each of the first and second cross-over paths, each TDL including a plurality of complex taps which are individually responsive to control signals for appropriately changing a current tap setting and a resultant output signal of each TDL;

a first adder means (32) for adding the output signals from the TDLs in the first straight-through path and the second cross-over path;

second adder means (33) for adding the output signals from the TDLs in the second straight-through path and the first cross-over path; and

tap adjusting means (29, 30) coupled to the output of the first and second adder means and to the complex taps of the TDLs in the TDL matrix for generating appropriate



control signals to the complex taps of the TDL matrix for appropriately changing the tap settings to effect concurrent equalization and cross-polarization component convergence in each of the first and second orthogonally polarized signals at the output of the first and second adder means, respectively, the tap adjusting means generating the appropriate control signals to each of the complex taps as derived from the addition of an associated current complex tap signal and an updated gradient representative of a vector of the component of the associated TDL signal in accordance with the relationship

$$\min E\,(|z_{Hn}|^2 - E|a_n|^4)^2$$
$$(c_{11}c_{12})$$

$$\min E\,(|z_{vn}|^2 - E|b_n|^4)^2$$
$$(c_{21}c_{22})$$

where E represents an average of the associated term; a_n and b_n are the n^{th} complex data symbol of the first and second orthogonally polarized signals, respectively; z_{Hn} and Z_{vn} are the complex samples at time nT of the first and second orthogonally polarized signals, respectively, at the output of the respective first and second adder means; and c_{ij} identify a TDL within the TDL matrix where i and j designate the input to output path, respectively, of the TDL and 1 and 2 indicate the respective first and second orthogonally polarized signals.

4,631,735

CODED MODULATION SYSTEM WITH FEEDBACK

Shahid U. H. Qureshi, Natick, Mass., assignor to Codex Corporation, Mansfield, Mass.

Filed Dec. 28, 1984, Ser. No. 687,205

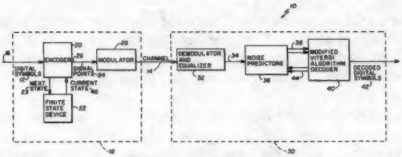
Int. Cl.[4] H04B *1/10*

U.S. Cl. 375—34 **15 Claims**

1. A communication system comprising a transmitter, and a receiver for use in deciding which signal points were sent from said transmitter based on corresponding noise affected signals received over a channel, said transmitter comprising an encoder for encoding a stream of information symbols into said signal points, said noise affected signals carrying information about a particular sequence of possible states occupied in a succession of time intervals by a finite state means,

said receiver comprising feedback circuitry for generating a plurality of different modified versions of each said received signal, and

a decoder for deciding which signal points were sent based on estimating said particular sequence of states by using at least two different said modified versions, said decoder storing a plurality of surviving sequences of states each ending in a current state,



said feedback circuitry being connected to receive feedback information from said decoder,

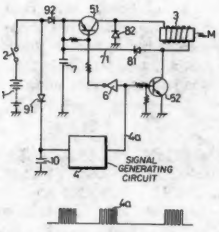
each said modified version being based on at least some states that are earlier in said surviving sequences than said current states.

4,631,736

PORTABLE TRANSMITTER WHICH CONSERVES TRANSMITTER POWER BY STORING CHARGES FROM PREVIOUS PULSES

Kouichi Yamanoue, and Junji Kitagawa, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Aug. 7, 1984, Ser. No. 638,649
Claims priority, application Japan, Sep. 8, 1983, 58-165688
Int. Cl.⁴ H02M *3/17*
U.S. Cl. 375—71 **11 Claims**



6. A portable transmitter, comprising:

a switch adapted to be coupled to a source of electric current;

transmitting means for transmitting a signal, said transmitting means having first and second ends;

first switching means, coupled between said switch and said transmitting means first end, for selectively providing electric current to said transmitting means;

second switching means, coupled between said transitting means second end and ground, for selectively causing said electric current to flow through said transmitting means;

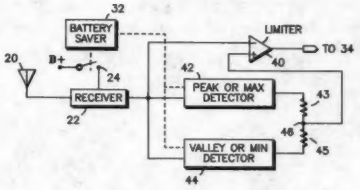
storing means, coupled between ground and said transmitting means second end, for storing an electric charge induced by said transmitting means when said first switching means is not providing electric current to said transmitting means.

4,631,737

SELF BIASING DIRECT COUPLED DATA LIMITER

Walter L. Davis, Coral Springs; Yolanda Prieto, Miami, and George W. Smoot, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 6, 1984, Ser. No. 678,933
Int. Cl.⁴ H04L *27/14, 25/06;* H04B *1/16*
U.S. Cl. 375—88 **17 Claims**



1. In a frequency shift keying receiver having a plurality of radio frequency elements including a discriminator which is the last stage of said elements, said receiver including power switching means coupled to a power source for periodically supplying power to said elements, a limiter interface circuit coupled to said discriminator, comprising:

a signal limiter directly coupled to said discriminator;

first detection means having an input coupled to said discriminator for detecting a peak or maximum signal magnitude and producing an output signal corresponding thereto;

second detection means having an input coupled to said discriminator for detecting a valley or minimum signal magnitude and producing an output signal corresponding thereto;

said first and second detection means being coupled to said power switching means and said first and second detection means each include means, responsive to said power switching means, for initializing the magnitudes of the corresponding output signals; and

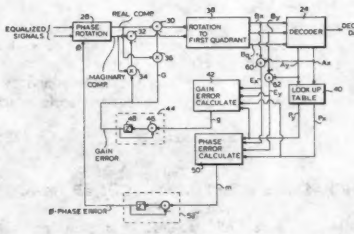
means coupling the output signals from said first and second detection means to said signal limiter to provide a reference signal thereto.

4,631,738

GAIN TRACKER FOR DIGITAL MODEM

William L. Betts, St. Petersburg, and Edward Zuranski, Largo, both of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Dec. 6, 1984, Ser. No. 678,652
Int. Cl.⁴ H04L *27/08*
U.S. Cl. 375—98 **4 Claims**



1. In a modem for receiving a QAM encoded data signal which corresponds to a received vector, and having a decoder adapted to generate an ideal vector corresponding to said received vector, an error corrector comprising:

means for obtaining the radial component in the direction of

said ideal vector of an error vector, said error vector being a difference vector between said received and ideal vectors;

means for obtaining a gain error signal determined by said radial component; and

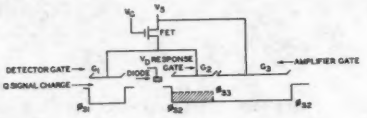
first means for modifying said received vector in accordance with said gain error signal.

4,631,739

HIGH DYNAMIC RANGE CHARGE AMPLIFIER

Roland J. Handy, Northridge, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1984, Ser. No. 675,599
Int. Cl.[4] H03F *3/04*
U.S. Cl. 377—60 **1 Claim**



1. A high dynamic range charge amplifier integrated circuit which permits the sensing and amplifying of low quantities of charge, wherein the improvement comprises:

a first detector gate means (G_1) on said integrated circuit,

a second response gate means (G_2) on said integrated circuit in spaced proximity to said first gate means (G_1),

means on said integrated circuit for electrically connecting said first and second gate means together,

field effect transistor means coupled to a supply voltage (V_S) and said electrical connecting means, said field effect transistor means applying said supply voltage (V_S) to said electrical connecting means and thus said first and second gate means, when said field effect transistor means is enabled by a gate voltage (V_G), and said first and second gate means floating at said supply voltage (V_S) when said gate voltage (V_G) is removed,

a source of charge (Q) to be amplified deposited beneath said first gate means (G_1), such that the supply voltage (V_S) floating on said first gate means (G_1) is affected by the change in surface potential (ϕ_{S1}) beneath said first gate means (G_1), the voltage on said second gate means (G_2) being affected, thereby varying the surface potential (ϕ_{S2}) beneath said second gate means (G_2),

a third amplifier gate means (G_3) in close proximity to said second gate means (G_2) and connected to said supply voltage (V_S) and directly affected by said surface potential (ϕ_{S2}) beneath said second gate means (G_2), said third gate means (G_3) defining a larger area wherein additional charge can be deposited beneath both said second and third gate means (G_2, G_3) in direct proportion to the amount of charge (Q) deposited beneath said first gate means (G_1), and

diode means between said first gate means (G_1) and said second gate means (G_2) for injecting charge beneath said second and third gate means (G_2, G_3), and then to subsequently dissipate all charge over that determined by the original surface potential (ϕ_{S2}) and the affected surface potential (ϕ_{S3}).

4,631,740

TIME BASE GENERATOR FOR COLOR IMAGE PROCESSOR

Galen Collins, San Jose, Calif., assignor to Benson, Inc., Mountain View, Calif.

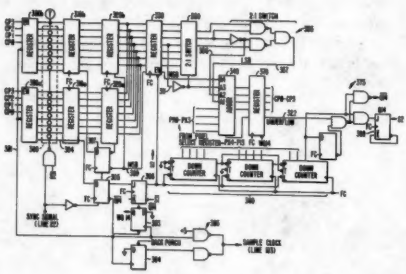
Filed Apr. 9, 1985, Ser. No. 721,353
Int. Cl.[4] H03K *17/28*
U.S. Cl. 377—76 **14 Claims**

1. A circuit controlled by a clock signal having a clock period, the circuit for producing an output signal at an output terminal at a selected time after receiving an input signal at an input terminal, which selected time includes an integral number of clocks periods and a fraction of a clock period, the circuit comprising:

delay line means connected to the input terminal for delaying a signal, the delay line means including a plurality of taps thereto;

first register means connected to receive the clock signal and connected to each of the taps to thereby provide data indicative of a measure of a first time delay between the time of the input signal and the time of the first clock signal;

subtracting means connected to receive the data indicative of the fraction of a clock period of the selected time, and connected to receive the data indicative of the measure of



the first time delay, for subtracting the first time delay from the fraction of a clock period of the selected time, to thereby provide data indicative of a measure of a second time delay;

counting means connected to receive the clock signal to count the integral number of clock periods, and connected to the subtracting means, for supplying an intermediate signal when only the second time delay remains before the output signal is to be produced;

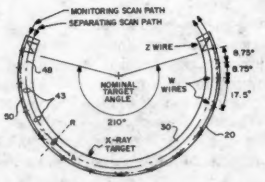
second register means connected to the output terminal, connected to each of the taps of the delay line means, and connected to receive the data from the subtracting means, the second register means for selectively connecting one of the taps to the output terminal to thereby provide the output signal in response to the intermediate signal.

4,631,741

BEAM SPOT MONITORING ARRANGEMENT FOR USE IN A SCANNING ELECTRON BEAM COMPUTED TOMOGRAPHY SCANNER AND METHOD

Roy E. Rand, Palo Alto, and John L. Couch, San Francisco, both of Calif., assignors to Imatron, Inc., San Francisco, Calif.

Filed Apr. 5, 1984, Ser. No. 597,133
Int. Cl.[4] H05G *1/52*; H01J *35/30, 35/14*
U.S. Cl. 378—10 **14 Claims**



1. In a scanning electron beam computed tomography scanner including means defining a vacuum chamber, means for producing an electron beam at one location in said chamber

and for directing it to a second location therein, a target of the type which produces x-rays as a result of the impingement thereon by said electron beam, and means at said second location for causing said beam to scan a section of said target in a way which causes it to impinge and form a beam spot on said target along a given scan path and thereby produce x-rays, the improvement comprising means for detecting the entire profile of said beam spot at a plurality of different points along said scan path and for determining if said actual profile conforms to a desired profile of said beam spot at each of said points and, in the case of a desired non-circular beam spot, for determining if the spot detected at each point conforms to a desired orientation, said detecting means also detecting the position of said beam spot on said target laterally and longitudinally relative to the scan path as said spot moves along said path, said detecting means including an electron beam intercepting arrangement at each of said points along said scan path immediately in front of said target, each of said arrangements being designed to produce a plurality of electrical signals upon impingement by said beam such that configuration of said signals vary in shape and temporal positioning, relative to one another with the profile, lateral position and orientation of said beam spot, such that the configuration and temporal positioning of said signals are used to monitor the profile, lateral position and orientation of said beam spot.

4,631,742

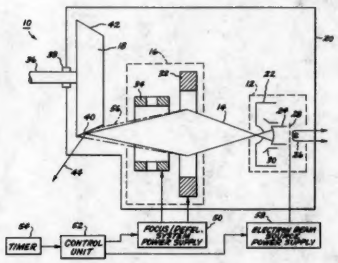
ELECTRONIC CONTROL OF ROTATING ANODE MICROFOCUS X-RAY TUBES FOR ANODE LIFE EXTENSION

David W. Oliver, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 25, 1985, Ser. No. 704,983

Int. Cl.[4] H05G *1/52*

U.S. Cl. 378—113 **12 Claims**



1. A method of extending the life of an anode of an x-ray tube of the type in which an electron bean from an electron beam source is focused onto the anode to produce x-rays, the method comprising the steps of:

defocusing the electron beam upon turn-on of the tube to apply a reduced electron beam power density to the anode, the reduced power density having a value selected to be less than a normal operating electron beam power density and to minimize thermal stresses in the anode;

maintaining said reduced power density for a predetermined period of time sufficient to afford a controlled increase in anode temperature to a predetermined temperature at which the anode is ductile; and

focusing the electron beam after said predetermined period of time to increase the power density applied to the anode to said normal operating power density.

4,631,743

X-RAY GENERATING APPARATUS

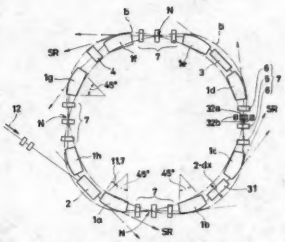
Takio Tomimasu, Yatabemachi; Tsutomu Noguchi, Kukisakimachi; Hiroshi Tanino, Sakuramura, and Suguru Sugiyama, Ishioka, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Sep. 24, 1984, Ser. No. 653,588

Claims priority, application Japan, Sep. 22, 1983, 58-175517; Sep. 27, 1983, 58-178984

Int. Cl.[4] H05H *13/04*

U.S. Cl. 378—138 **10 Claims**



1. An X-ray generating apparatus, comprising: a source of electrons

a plurality of deflecting electromagnets disposed along an electron orbit;

at least one high-frequency cavity disposed between pair of adjacent deflecting electromagnets and adapted to accelerate electrons;

a multipole electromagnetic mechanism formed of at least one multipole electromagnet disposed between a pair of adjacent deflecting electromagnets and focusing electrons in the horizontal direction and/or the vertical direction; and

at least one deflecting means disposed between a pair of adjacent deflecting electromagnets and undulating the orbit of electrons around a design orbit.

4,631,744

X-RAY TUBE

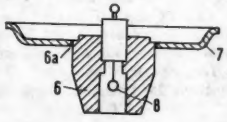
Klaus Haberrecker, Bubenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 21, 1984, Ser. No. 673,737

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342688

Int. Cl.[4] H01J *35/06, 35/26*

U.S. Cl. 378—138 **12 Claims**



1. In an x-ray tube having an envelope containing a cathode and an anode, said cathode having a cathode head and a support means for said cathode head and an electron source disposed within said cathode head, the improvement comprising a cathode head consisting of ferromagnetic material having a Curie point greater than 700° C., and said cathode head being soldered to said support means.

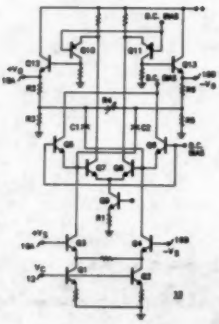
5. In an x-ray tube having an envelope containing a cathode and an anode, said cathode having a cathode head and a support means for said cathode head and an electron source disposed within said cathode head, the improvement comprising

a cathode head consisting of ferromagnetic material having a Curie point greater than 700° C., and said cathode head being welded to said support means.

4,631,745
ANALOG DIVIDER WITH MINIMAL PHASE DISTORTION

Charles J. Marik, Richmond, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 26, 1985, Ser. No. 727,936
Int. Cl.⁴ H04H 5/00
U.S. Cl. 381—15 **6 Claims**

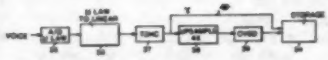


1. An analog voltage divider circuit comprising:
first input means for receiving an analog voltage signal;
second input means for receiving a control voltage signal;
first circuit means coupled to the first and second input means for providing signals which are functions of the logarithms of said analog voltage signal and of said control voltage signal, respectively, and producing a third signal which is a function of the difference between said logarithmic function signals;
second circuit means coupled to the first circuit means for deriving a fourth signal which is a function of the antilog of said third signal;
output means coupled to the second circuit means for providing a buffered output signal from said third signal; and
passive feedback means coupled to the second circuit means and the output means for compensating for unwanted phase deviation due to non-voltage-tracking capacitances within the divider circuit.

4,631,746
COMPRESSION AND EXPANSION OF DIGITIZED VOICE SIGNALS

Lawrence E. Bergeron, Andover; Daniel F. Daly, Lowell, and Elaine C. Grosso, Billerica, all of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Feb. 14, 1983, Ser. No. 466,250
Int. Cl.⁴ G10L 5/00
U.S. Cl. 381—35 **34 Claims**

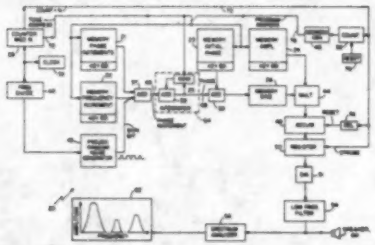


1. A method of compressing a digital input signal representative of a continuously-varying input signal into a digital pitch value and a plurality of associated signal values, said digital input signal including a plurality of binary words, each representative of the amplitude of said continuously-varying input signal sampled at successive intervals of time, including the steps of:
processing a selected plurality of the binary words of said digital input signal to determine the pitch period of said continuously-varying input signal and providing a digital pitch value representative thereof;
performing a time domain harmonic compression on a first plurality of said binary words in response to said pitch value to provide a TDHC output signal representative of the digital input signal but compressed in time by a first predetermined factor, so that said TDHC output signal has a second plurality of binary words equal to said first plurality divided by said first factor;
interpolating, in response to the TDHC output signal, a predetermined number of binary words between each pair of binary words in the TDHC output signal to provide an expanded signal representative of the TDHC output signal but having a plurality of binary words equal to said second plurality multiplied by a second factor;
encoding said expanded signal by means of a delta modulator to provide an encoded output signal wherein each word in the expanded signal is converted into one bit in the encoded output signal representative of the slope of the expanded signal, the encoded output signal providing said signal values.

4,631,747
DIGITAL SOUND SYNTHESIZER

Arthur J. Tardif, Warren, R.I., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 674,365, Nov. 26, 1984, abandoned, which is a continuation of Ser. No. 549,016, Nov. 4, 1983, abandoned, which is a continuation of Ser. No. 417,732, Sep. 13, 1982, abandoned, which is a continuation of Ser. No. 252,966, Apr. 10, 1981, abandoned, which is a continuation of Ser. No. 85,166, Oct. 15, 1979, abandoned, which is a continuation of Ser. No. 925,130, Jul. 17, 1978, abandoned. This application Feb. 24, 1986, Ser. No. 834,139
Int. Cl.⁴ G10L 5/00
U.S. Cl. 381—51 **2 Claims**



1. A sound synthesizer comprising:
a first (21) and second (22) memory each containing a plurality of addresses, each address containing a numeral, the numeral of said second memory being smaller than the numeral contained in the corresponding address of said first memory;
addressing means (29) for repetitively providing a sequence of addresses to said first and second memories to provide a first and second sequence of numerals from corresponding addresses of said first and second memories respectively;
means (42) for providing a random sign bit to each of said sequence of numerals from said second memory to provide a polarized second numeral sequence;
first means (37) adding each of said first and said polarized second numerals of said first and second sequences;
a third memory (25) containing a plurality of addresses and corresponding storage cells and responsive to said ad-

dressing means (29) to provide a sequence of numerals from each of said addresses;

second means (38) for adding the read-out numeral contents of each storage cell at each address of said third memory (25) to the numeral of the corresponding address of the sequence of numerals provided by said first adding means (37);

said second adding means (38) having a modulo numeral sum output;

a fourth memory (26) containing sine values over the range of numerals of the same modulus as provided by said second adding means (38), said fourth memory being responsive to each numeral of the sequence of numerals provided by said second adding means (38) to provide a sequence of numerals representing the sine values of said numerals corresponding to said sequence of addresses;

a fifth memory (24) providing output numerals at its addresses corresponding to the addresses provided by said address providing means to thereby provide a succession of numerals;

means (44) multiplying the numerals of the succession of numerals of corresponding addresses of said fith memory (24) and of said fourth memory (26) to provide a succession of products;

means (48) accumulating each product of said succession of products to provide a final sum after each sequence of addresses to thereby provide a succession of final sums;

means (50) storing each said final sum value of said succession of final sums until replaced by the succeeding final sum to provide a synthesized sound.

4,631,748

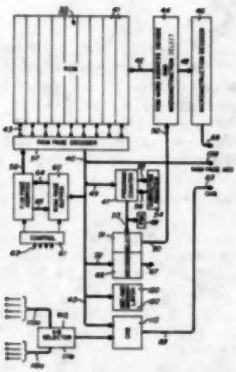
ELECTRONIC HANDHELD TRANSLATOR HAVING MINIATURE ELECTRONIC SPEECH SYNTHESIS CHIP

Paul S. Breedlove; James H. Moore; George L. Brantingham, all of Lubbock, and Richard H. Wiggins, Jr., Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 44,804, Jun. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 901,395, Apr. 28, 1978, abandoned. This application Feb. 24, 1982, Ser. No. 351,844

Int. Cl.[4] G10L *5/00*

U.S. Cl. 381—51 **6 Claims**



1. An electronic language translator comprising:

memory means having digital data stored therein including digital speech data from which synthesized speech as words in more than one human language may be derived:

operator input means for receiving an operator input indicative of a request in a first human language for a particular word or phrase in a second human language, said operator input means comprises a keyboard having a plurality of individual keys, including numbered keys representative of numbers "0" through "9", which are manually actuatable in correspondence to a predetermined code for selectively indicating a request in said first human language for a particular word or phrase in said second human language, said predetermined code derivable from said digital speech data stored in said memory means comprises respective numbers corresponding to particular words or phrases;

control means responsive to the operator input received by said operator input means for selectively acessing digital speech data from said memory means corresponding to the indicated request for a particular word or phrase in said second human language;

speech synthesizer means operably associated with said memory means and said control means for receiving selected digital speech data from said memory means in response to the accessing thereof by said control means to generate analog audio signals representative of human speech in said second huyman language; and

audio means coupled to said speech synthesizer means for converting said analog audio signals generated thereby into audible human speech for pronouncing said particular word or phrase in said second human language;

wherein the selective actuation of at least one numbered key of said keyboard by the operator as an operator input indicating a request for a particular word or phrase in said second human language.

4,631,749

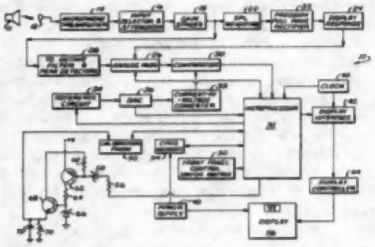
ROM COMPENSATED MICROPHONE

Mark Rapaich, Stevensville, Mich., assignor to Heath Company, St. Joseph, Mich.

Filed Jun. 22, 1984, Ser. No. 623,647

Int. Cl.[4] H03G *5/00*

U.S. Cl. 381—103 **11 Claims**



1. A system for compensating for the nonlinear frequency response of a microphone in an audio signal processing apparatus, said system comprising:

conversion means coupled to said microphone for converting an audio signal received by said microphone to a digital signal;

memory means for storing data representing a frequency response complementary to the nonlinear frequency response of said microphone; and

signal processing means coupled to said conversion means and to said memory means for respectively receiving and reading said digital audio signal and said complementary frequency response data therefrom and for combining said digital audio signal and said complementary frequency response data for generating a linearly compensated audio signal independent of the microphone's environment, wherein the microphone and said memory means form a frequency compensated matched pair.

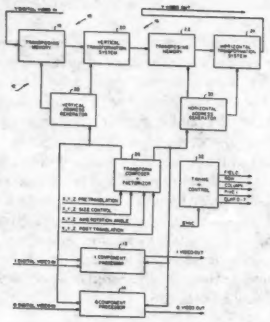
4,631,750
METHOD AND SYSTEM FOR SPACIALLY TRANSFORMING IMAGES

Steven A. Gabriel, Sunnyvale, and Lawreuce J. Evans, Los Gatos, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 310,907, filed as PCT US81/00471, Apr. 10, 1981, abandoned, which is a continuation-in-part of Ser. No. 139,589, Apr. 10, 1980, abandoned. This application Jul. 24, 1984, Ser. No. 634,177

Int. Cl.⁴ G06K 9/32

U.S. Cl. 382—41 **48 Claims**



1. A method of electronically transforming input data samples corresponding to picture elements of an image, said transforming corresponding to transformation of said picture elements of said image from a source location to a target location according to a dimensionally interdependent spatial transformation in a multidimensional coordinate system in which a plurality of coordinates indicate position in respective coordinate directions, said method comprising

factoring said interdependent transformation into a plurality of factors each corresponding to a transformation providing repositioning of picture elements in a respective single said coordinate direction, at least one of said factors being a function of a plurality of said coordinates,

successively and separately electronically applying each of said factors to said data samples to produce transformed data samples according to the respective transformation corresponding to repositioning of respective picture elements in the respective coordinate direction for said factor without repositioning in another coordinate direction, any succeeding application of a said factor being made to said data samples as transformed according to the preceding application.

4,631,751
METHOD FOR ENLARGING A BINARY IMAGE

Karen L. Anderson, A4 Hudson View Estates, Lakeview Dr., Peekskill, N.Y. 10566; Frederick C. Mintzer, 3798 Oriole Ct., Shrub Oak, N.Y. 10588, and Gerald Goertzel, 7 Sparrow Cir., White Plains, N.Y. 10605

Filed Oct. 24, 1984, Ser. No. 664,190

Int. Cl.⁴ G06K 9/42

U.S. Cl. 382—47 **14 Claims**

1. A method for enlarging a binary digital image along two orthogonal axes by factors of F1 and F2, respectively, comprising the steps of:

storing said image in raster scan order in an input storage area in a computer;

rotating said stored image by rearranging the raster data representing said stored image to create a representation of the image in raster scan order with the one of said axes originally oriented horizontally rotated in a first direction by ninety degrees;

inserting one or more rows of expansion bits along said one of said orthogonal axes of said rotated image to convert i rows of bits to j rows of bits, where $i<j<=2i$, and assigning a value to each expansion bit inserted by the steps as follows:

(1) initializing a counter to a value between T−S and T, where T is an integer selected as a threshold value and S is an integer such that the rounded value of (F1−1)*S is not equal to zero;

(2) processing the stored image by the steps of:

(a) incrementing said counter by I, where I is an integer equal to the rounded value of (F1−1)*S;

(b) copying a first row of said stored image from said input storage area into an output storage area in which the enlarged image is to be stored;

(c) comparing the counter value to T;

(d) if the counter value is not between T−S and T, then

(i) inserting a row of bits in the output storage area adjacent to said copied first row;

(ii) assigning values to all the bits in said inserted row based upon the values of the bits in at least one neighboring row of said first row in said input storage area;

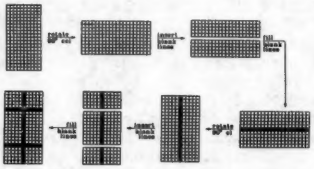
(iii) decrementing the counter by S; and

(e) if the counter value is between T−S and T, then omitting said steps (i), (ii), and (iii);

(3) repeating said processing steps (a)–(e) until all rows of the stored image have been processed; then

(4) replicating in said output storage area the last remaining stored image row in said input storage area if the limit of said output storage area has not been reached;

repeating said step of inserting and assigning a predetermined number of times to achieve an enlargement by a factor of F1 along said one orthogonal axis;



Steps of the Expansion Process

rotating said enlarged image in said output storage area by rearranging the raster data representing said enlarged image to create a representation of the image in raster scan order with said one orthogonal axis rotated in a second direction opposite said first direction by ninety degrees;

inserting one or more rows of expansion bits along the other of said orthogonal axes in said rotated enlarged image to convert i' rows of bits to j' rows of bits, where $i'<j'<=2i'$, and assigning a value to each expansion bit inserted by the steps as follows:

(6) initializing a counter to a value between T'−S' and T', where T' is an integer selected as a threshold value and S' is an integer such that the rounded value of (F2−1)*S' is not equal to zero;

(7) processing a first row of the rotated enlarged image by the steps of:

(f) incrementing said counter by I', where I' is an integer equal to the rounded value of (F2−1)*S';

(g) copying said first row into a second output storage area;

(h) comparing the counter value to T';

(j) if the counter value is between T'−S' and T', then

(iv) inserting a row of bits in the second output storage area adjacent to said copied first row;

(v) assigning values to all the bits in said inserted row based upon the values of the bits in at least one neighboring row of said first row in said output storage area;

(vi) decrementing the counter by S'; and

(k) if the counter value is between T'−S' and T', inclusive, then omitting said steps (iv), (v), and (vi);

(8) repeating said processing steps (f)–(k) until all rows of the rotated enlarged image have been processed;

(9) replicating in said second output storage area the last remaining stored image row in said output storage area if the limit of said second output storage area has not been reached; and

repeating said step of inserting and assigning along said other orthogonal axis a predetermined number of times to achieve an enlargement by a factor of F2 along said other orthogonal axis.

DESIGN PATENTS

GRANTED DEC. 23, 1986

ERRATA

For CLASS	See PATENT NO.
D29-016	287,300
D02-331	287,366

DESIGNS

DECEMBER 23, 1986

287,300

FACE SHIELD ATTACHMENT FOR A SAFETY HELMET

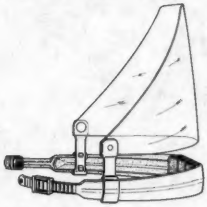
Bo G. Lönnstedt, Kvarnbergsvägen 23, S-141 45 Huddinge, Sweden

Filed Dec. 21, 1984, Ser. No. 685,062

Claims priority, application Sweden, Jul. 4, 1984, 84-1990

Term of patent 14 years

U.S. Cl. D29—16



287,301

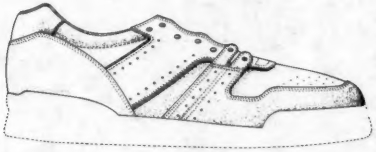
SHOE UPPER

James K. Tong, Beaverton, Oreg., assignor to Pensa, Inc., Portland, Oreg.

Filed Feb. 14, 1986, Ser. No. 834,022

Term of patent 14 years

U.S. Cl. D2—314



287,302

SHOE INSOLE

Robert L. Peterson, Taichung, Taiwan, assignor to Pensa, Inc., Portland, Oreg.

Filed Feb. 24, 1986, Ser. No. 834,866

Term of patent 14 years

U.S. Cl. D2—318

287,303

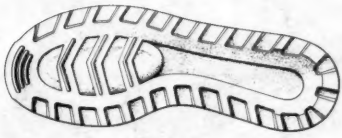
SHOE SOLE

Robert L. Peterson, Taichung, Taiwan, assignor to Pensa, Inc., Portland, Oreg.

Filed Feb. 24, 1986, Ser. No. 834,868

Term of patent 14 years

U.S. Cl. D2—320



287,304

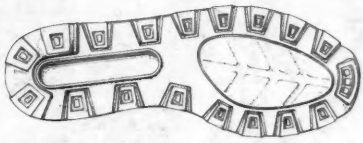
SHOE SOLE

Robert L. Peterson, Taichung, Taiwan, and James K. Tong, Beaverton, Oreg., assignors to Pensa, Inc., Portland, Oreg.

Filed Feb. 24, 1986, Ser. No. 834,867

Term of patent 14 years

U.S. Cl. D2—320



287,305

PAGER CARRYING CASE

Frederick D. Brown, P.O. Box 16881, Orlando, Fla. 32861

Filed Feb. 13, 1984, Ser. No. 579,606

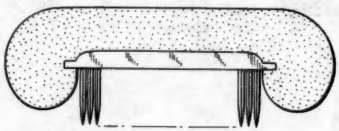
Term of patent 14 years

U.S. Cl. D3—106

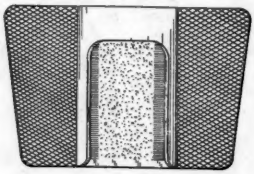
287,306
UMBRELLA HANDLE
Ann S. Cain, Cincinnati, Ohio, assignor to 'totes', incorporated, Loveland, Ohio
Filed Nov. 5, 1984, Ser. No. 668,626
Claims priority, application Taiwan, Mar. 6, 1985, 74301064
Term of patent 14 years
U.S. Cl. D3—12

287,307
UMBRELLA HANDLE
Ann S. Cain, Cincinnati, Ohio, assignor to 'totes', incorporated, Loveland, Ohio
Filed Nov. 5, 1984, Ser. No. 667,968
Claims priority, application Taiwan, Mar. 6, 1985, 74301059
Term of patent 14 years
U.S. Cl. D3—12

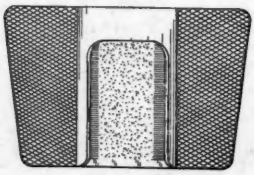
287,308
SCRUB BRUSH WITH WRAP AROUND SPONGE
Jack W. Kaufman, 357 Frankel Blvd., Merrick, N.Y. 11566
Filed Feb. 4, 1985, Ser. No. 697,850
Term of patent 14 years
U.S. Cl. D4—116



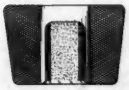
287,309
HYGIENE BRUSH ASSEMBLY
Griffith C. Miller, Norman, Okla., assignor to Dr. Miller's Health Care Products, Inc., Norman, Okla.
Filed Jan. 9, 1984, Ser. No. 569,322
The portion of the term of this patent subsequent to Dec. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—119



287,310
FOOT SCRUBBING BRUSH
Griffith C. Miller, Norman, Okla., assignor to Dr. Miller's Health Care Products, Inc., Norman, Okla.
Filed Jan. 9, 1984, Ser. No. 569,348
The portion of the term of this patent subsequent to Dec. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—119



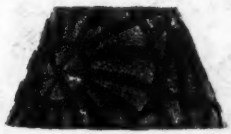
287,311
FOOT HYGIENE DEVICE
Griffith C. Miller, Norman, Okla., assignor to Dr. Miller's Health Care Products, Inc., Norman, Okla.
Filed Jan. 9, 1984, Ser. No. 569,327
The portion of the term of this patent subsequent to Dec. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—119



287,312
PAINT ROLLER
Kiyoshi Hori, Osaka, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Mar. 9, 1983, Ser. No. 473,438
Claims priority, application Japan, Sep. 10, 1982, 57-41579
The portion of the term of this patent subsequent to Aug. 31, 1990, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—123

287,313
PAINT ROLLER
Kiyoshi Hori, Osaka, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Mar. 9, 1983, Ser. No. 473,441
Claims priority, application Japan, Sep. 10, 1982, 57-41576
The portion of the term of this patent subsequent to Aug. 31, 1990, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—123

287,314
PAINT ROLLER
Kiyoshi Hori, Osaka, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Mar. 9, 1983, Ser. No. 473,440
Claims priority, application Japan, Sep. 10, 1982, 57-41577
The portion of the term of this patent subsequent to Aug. 31, 1990, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—123

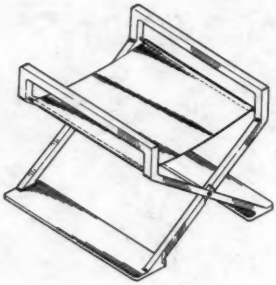


287,315
COMBINED CHAIR AND STEP STOOL
Valeska Ginouves, 1142 Farmington Ave., West Hartford, Conn. 06107
Filed Oct. 21, 1983, Ser. No. 544,089
Term of patent 14 years
U.S. Cl. D6—335

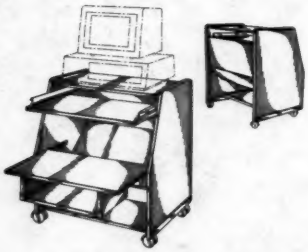
287,316
OTTOMAN
Robert D. Vanderminden, Granville, N.Y., assignor to The Telescope Folding Furniture Co., Granville, N.Y.
Filed May 18, 1984, Ser. No. 611,704
Term of patent 14 years
U.S. Cl. D6—349

287,317
TRICYCLE SEAT
David A. Allen, and Robert L. Diekman, both of Centerville, Ohio, assignors to Huffy Corporation, Dayton, Ohio
Filed Apr. 25, 1984, Ser. No. 603,873
Term of patent 14 years
U.S. Cl. D6—354

287,318
PORTABLE, FOLDING DIAPER CHANGING TABLE
Stephanie Garduno, 13 Bull Run, Irvine, Calif. 92714
Filed Apr. 19, 1984, Ser. No. 602,006
Term of patent 14 years
U.S. Cl. D6—429

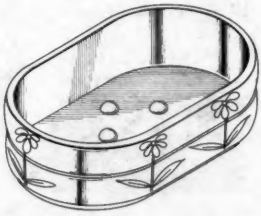


287,319
COMPUTER WORKSTATION
Carlos V. Ugalde, San Dimas, Calif., assignor to Continental Engineering Group, Inc., Irwindale, Calif.
Filed Dec. 24, 1985, Ser. No. 813,000
Term of patent 14 years
U.S. Cl. D6—474

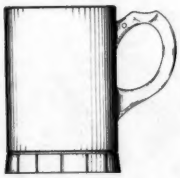


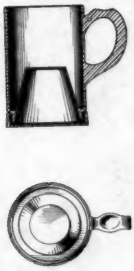
287,320
TOOTHBRUSH HOLDER
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Sep. 11, 1984, Ser. No. 649,352
Term of patent 14 years
U.S. Cl. D6—534

287,321
SOAP DISH
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Sep. 11, 1984, Ser. No. 649,356
Term of patent 14 years
U.S. Cl. D6—539



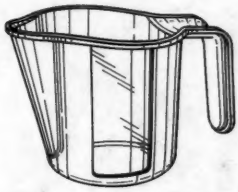
287,322
BEVERAGE MUG
Fred R. Martin, 136 Stillman Loop, Benton, Ark. 72015
Filed May 31, 1984, Ser. No. 615,800
Term of patent 14 years
U.S. Cl. D7—9





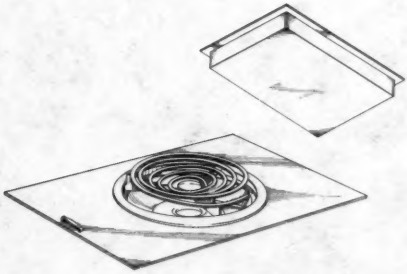
287,323
TUMBLER
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Sep. 11, 1984, Ser. No. 649,354
Term of patent 14 years
U.S. Cl. D7—12

287,324
MEASURING PITCHER OR THE LIKE
Janice L. Schmidt, Providence, R.I., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Jan. 16, 1984, Ser. No. 571,015
Term of patent 14 years
U.S. Cl. D7—50



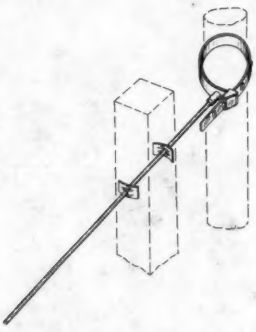
287,325
MEASURING PITCHER OR THE LIKE
Janice L. Schmidt, Providence, R.I., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Jan. 16, 1984, Ser. No. 571,016
Term of patent 14 years
U.S. Cl. D7—50

287,326
WOK COOKTOP
Stanley M. Joseph, Glendale, Calif., assignor to Distinctive Appliances, Inc., Pasadena, Calif.
Filed Jan. 17, 1983, Ser. No. 458,613
Term of patent 14 years
U.S. Cl. D7—346

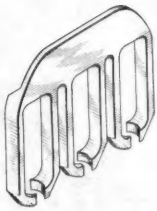


287,327
FOOD PROCESSOR
Alfredo Cavalli, 9, Via G. Galilei, Pessano Con Bornago, Milan, Italy
Filed Jan. 6, 1984, Ser. No. 568,594
Claims priority, application Italy, Jul. 20, 1983, 22426/83[U]
Term of patent 14 years
U.S. Cl. D7—384

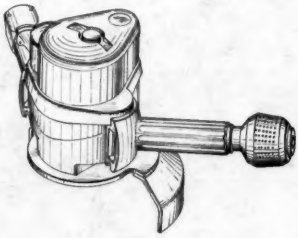
287,328
TREE SUPPORT
Clifford H. Paul, Troutdale, and Richard J. Paul, Portland, both of Oreg., assignors to Paul Brothers, Inc., Boring, Oreg.
Filed Apr. 9, 1984, Ser. No. 598,075
Term of patent 14 years
U.S. Cl. D8—1



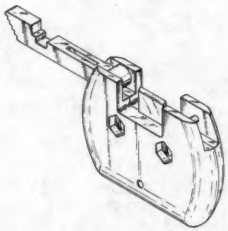
287,329
PUSH ROD HOLDER FOR DIESEL ENGINE WITH INSTALLED AFTERCOOLER
George Hamatani, Rte. 1, Box 400, Sacramento, Calif. 95612
Filed Apr. 12, 1984, Ser. No. 599,316
Term of patent 14 years
U.S. Cl. D8—14



287,330
PORTABLE GRINDING MACHINE
Karl G. Kårdén, Nacka, and Karl-Gustav Berger, Saltsjö-Duvnäs, both of Sweden, assignors to Atlas Copco AB, Nacka, Sweden
Filed May 29, 1984, Ser. No. 614,984
Term of patent 14 years
U.S. Cl. D8—62

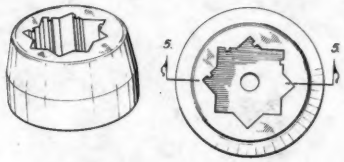


287,331
CUTTING TOOL FOR OPTICAL FIBERS WITH PROTECTIVE COVER
Kevin T. Monroe, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Jun. 29, 1984, Ser. No. 626,007
Term of patent 14 years
U.S. Cl. D8—98



287,332
COMBINATION TOOL FOR ADJUSTING SKI BINDINGS AND SKI BOOTS OR THE LIKE
Christopher L. Gamble, 2040 E. Howe, Tempe, Ariz. 85281
Filed Feb. 28, 1983, Ser. No. 470,255
Term of patent 14 years
U.S. Cl. D8—105

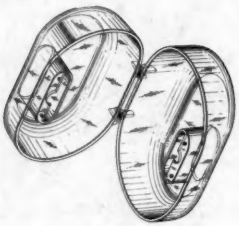
287,333
WINCH HANDLE HOLDER
Leigh J. Knudson, 629 Terminal Way, Costa Mesa, Calif. 92627
Filed Feb. 21, 1984, Ser. No. 582,206
Term of patent 14 years
U.S. Cl. D8—373



287,334
PACKAGING CONTAINER FOR CANDY OR THE LIKE
Pietro Ferrero, Brussels, Belgium, assignor to Ferrero S.p.A., Alba, Italy
Filed Aug. 23, 1984, Ser. No. 643,404
Claims priority, application Italy, May 18, 1984, 53392/84[U]
Term of patent 14 years
U.S. Cl. D9—318

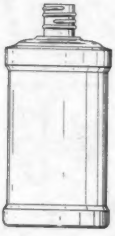
287,335
ALCOHOL APPLICATOR BOTTLE
Kent R. Anderson, Shawnee Mission, Kans., assignor to Larken Industries, Ltd., Lenexa, Kans.
Filed Sep. 24, 1984, Ser. No. 653,203
Term of patent 14 years
U.S. Cl. D9—338

287,336
CONTAINER FOR PACIFIERS
Peter Roehrig, Himmelschluesselweg 5, A-1160, Vienna, Austria
Filed Mar. 20, 1984, Ser. No. 591,518
Claims priority, application Austria, Sep. 21, 1983, 530508/83
Term of patent 14 years
U.S. Cl. D9—341

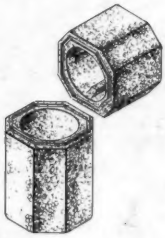


287,337
BOTTLE OR SIMILAR ARTICLE
Gerhard E. B. Nickel, Kennesaw, Ga., assignor to Sewell Plastics, Inc., Atlanta, Ga.
Filed Aug. 17, 1984, Ser. No. 641,746
Term of patent 14 years
U.S. Cl. D9—349

287,338
BOTTLE
Frederick N. Biesecker, Boyertown, Pa., assignor to Drug Plastics & Glass Company, Inc., Boyertown, Pa.
Division of Ser. No. 517,119, Jul. 25, 1983. This application Nov. 7, 1985, Ser. No. 803,993
Term of patent 14 years
U.S. Cl. D9—355



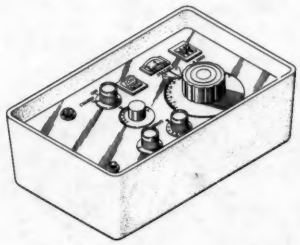
287,339
PACKAGING CONTAINER FOR A PHARMACEUTICAL VIAL
Daniel M. Dominski, Syracuse, N.Y., assignor to Bristol-Myers Company, New York, N.Y.
Filed Nov. 21, 1983, Ser. No. 553,604
Term of patent 14 years
U.S. Cl. D9—377



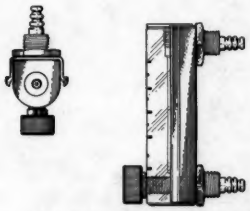
287,340
BOTTLE
Pierre Dinand, Levallois Perret, France, assignor to Saint-Gobain Desjonqueres, Courbevoie, France
Filed Aug. 7, 1984, Ser. No. 638,589
Claims priority, application France, Feb. 8, 1984, 840538
Term of patent 14 years
U.S. Cl. D9—401

287,341
WRISTWATCH
Gary Grimes, Kessel-Lo, Belgium, assignor to Timex Corporation, Waterbury, Conn.
Filed Jul. 27, 1984, Ser. No. 635,326
Term of patent 14 years
U.S. Cl. D10—30

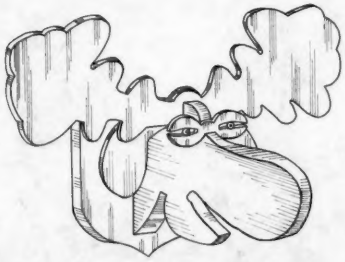
287,342
PASSIVE GEOPHYSICAL EXPLORATION DEVICE
Carl L. Kober, and H. David Procter-Gregg, both of Littleton, Colo., assignors to Denver Mineral Exploration Corp., Littleton, Colo.
Filed Apr. 20, 1984, Ser. No. 602,377
Term of patent 14 years
U.S. Cl. D10—75



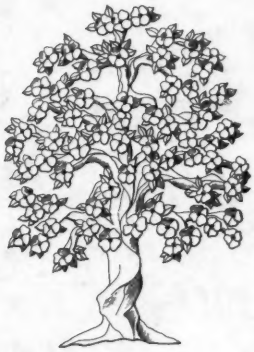
287,343
FLOWMETER
Craig Waters, Lansdale, Pa., assignor to Matheson Gas Products, Inc., Secaucus, N.J.
Division of Ser. No. 557,742, Dec. 2, 1983, Pat. No. Des. 283,805. This application Nov. 21, 1985, Ser. No. 806,018
Term of patent 14 years
U.S. Cl. D10—96



287,344
MOOSE HEAD TROPHY
John Hinnen, 4810 N. Prospect Rd., P.O. Box 5305, Peoria, Ill. 61601
Filed Mar. 26, 1984, Ser. No. 593,121
Term of patent 14 years
U.S. Cl. D11—134



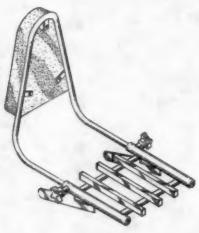
287,345
SCULPTURE
Gwen McLaughlin, Squan Rd., Clarksburg, N.J. 08510
Filed Nov. 5, 1984, Ser. No. 668,476
Term of patent 14 years
U.S. Cl. D11—139



287,346
BUD VASE
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Sep. 11, 1984, Ser. No. 649,353
Term of patent 14 years
U.S. Cl. D11—151

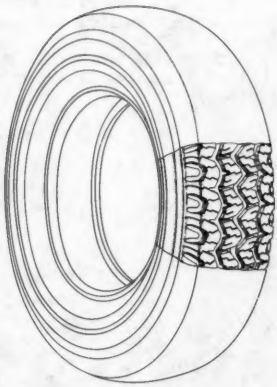
287,347
AQUATIC SCULPTURE OR SIMILAR ARTICLE
Otto Grun, 44 Cocoanut Row, Palm Beach, Fla. 33480
Filed Oct. 31, 1983, Ser. No. 547,068
Term of patent 14 years
U.S. Cl. D11—157

287,348
COMBINED BACK REST AND LUGGAGE RACK
Willard S. Larson, Box 338, Isanti, Minn. 55040
Filed Oct. 9, 1984, Ser. No. 658,580
Term of patent 14 years
U.S. Cl. D12—119

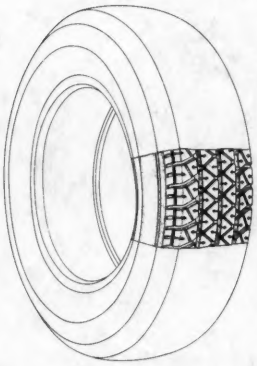


287,349
VEHICLE TIRE
Toshio Yonekura, Kishiwada; Kotaro Tsutsumi, Izumi, and Masaaki Minamitani, Sennan, all of Japan, assignors to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed May 11, 1984, Ser. No. 609,390
Claims priority, application Japan, Feb. 13, 1984, 59-4997
Term of patent 14 years
U.S. Cl. D12—140

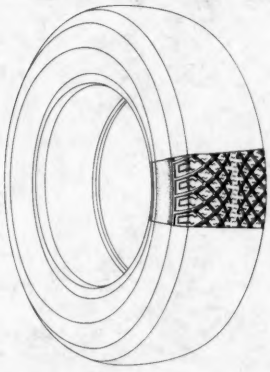
287,350
TIRE
David A. Weston, Greer, S.C., assignor to Michelin Recherche et Technique S.A., Basel, Switzerland
Filed Jun. 4, 1984, Ser. No. 616,957
Term of patent 14 years
U.S. Cl. D12—147



287,351
TIRE
Michael W. Cain, Simpsonville, S.C., assignor to Michelin Recherche et Technique S.A., Basel, Switzerland
Filed Nov. 15, 1984, Ser. No. 672,095
Term of patent 14 years
U.S. Cl. D12—147

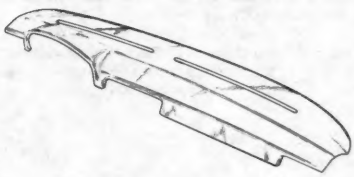


287,352
TIRE
Michael W. Cain, Simpsonville, S.C., assignor to Michelin Recherche et Technique S.A., Basel, Switzerland
Filed Nov. 15, 1984, Ser. No. 672,102
Term of patent 14 years
U.S. Cl. D12—151

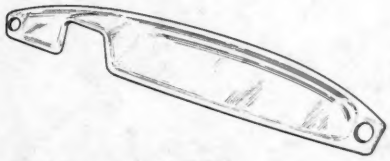


287,353
DASHBOARD COVER
Paul D. Cornwell, Littleton, Colo., assignor to Import Auto Products, Ltd., Denver, Colo.
Filed Aug. 17, 1984, Ser. No. 642,046
Term of patent 14 years
U.S. Cl. D12—192

287,354
DASHBOARD COVER
Paul D. Cornwell, Littleton, Colo., assignor to Import Auto Products, Ltd., Denver, Colo.
Filed May 14, 1984, Ser. No. 610,235
Term of patent 14 years
U.S. Cl. D12—192



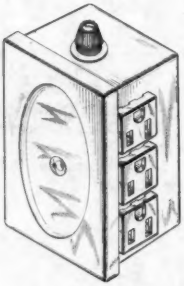
287,355
DASHBOARD COVER
Paul D. Cornwell, Littleton, Colo., assignor to Import Auto Products, Ltd., Denver, Colo.
Filed May 14, 1984, Ser. No. 610,236
Term of patent 14 years
U.S. Cl. D12—192



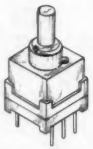
287,356
DASHBOARD COVER
Paul D. Cornwell, Littleton, Colo., assignor to Import Auto Products, Ltd., Denver, Colo.
Filed May 14, 1984, Ser. No. 610,231
Term of patent 14 years
U.S. Cl. D12—192

287,357
PLANING BOAT
Darris E. Allison, Rte. 3, Box 771, Louisville Rd., Louisville, Tenn. 37777
Filed May 29, 1984, Ser. No. 614,952
Term of patent 14 years
U.S. Cl. D12—314

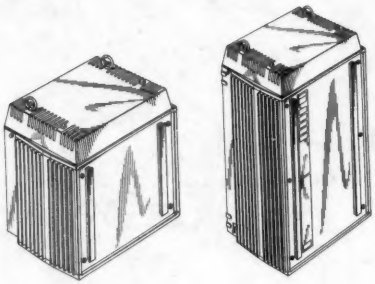
287,358
MULTIPLE OUTLET
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed May 7, 1984, Ser. No. 607,555
The portion of the term of this patent subsequent to Jul. 24, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—30



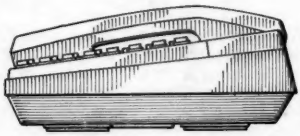
287,359
PUSH BUTTON SWITCH
Shigeo Ohashi, c/o Nihon Kaiheiki Kogyo Kabushiki Kaisha, 5-14 Minamimagome 1-chome, Ohta-ku, Tokyo, Japan
Filed Dec. 5, 1983, Ser. No. 558,051
The portion of the term of this patent subsequent to Oct. 1, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—32



287,360
CASING FOR ELECTRICAL EQUIPMENT
Kjeld Lehmann, Sondorborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark
Division of Ser. No. 539,930, Oct. 7, 1983, Pat. No. Des. 281,315. This application Nov. 7, 1985, Ser. No. 803,935
Term of patent 14 years
U.S. Cl. D13—40

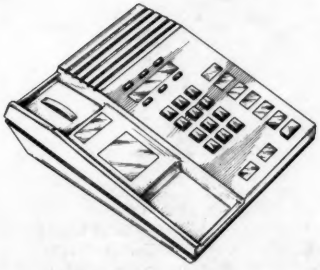


287,361
HANDSET AND STAND TELEPHONE UNIT
Akira Sekiguchi, Tokyo, and Hideaki Kodama, Sagamihara, both of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan
Filed Jul. 5, 1984, Ser. No. 627,834
Claims priority, application Japan, Mar. 12, 1984, 59-9514; Mar. 12, 1984, 59-9515
Term of patent 14 years
U.S. Cl. D14—53

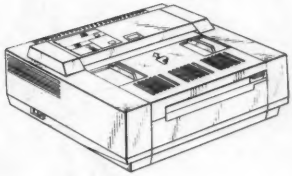


287,362
HANDSET TELEPHONE AND STAND UNIT
James M. Rittenhouse, Watchung; Barry M. Haber, Manalapan, and Ting W. Wong, Oceanport, all of N.J., assignors to Conair Corporation, Edison, N.J.
Filed Jul. 26, 1985, Ser. No. 759,177
Term of patent 14 years
U.S. Cl. D14—53

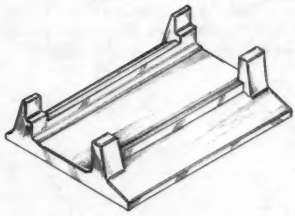
287,363
TELEPHONE SET BASE
Gerhart F. Klaiber, Paradise Valley, Ariz., and Donald Foggia, Ocean, N.J., assignors to Vodavi Technology Corporation, Scottsdale, Ariz.
Filed Sep. 21, 1984, Ser. No. 652,731
Term of patent 14 years
U.S. Cl. D14—62



287,364
FACSIMILE
Masahiro Kando, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 27, 1984, Ser. No. 583,736
Claims priority, application Japan, Aug. 31, 1983, 58-37922
Term of patent 14 years
U.S. Cl. D14—94

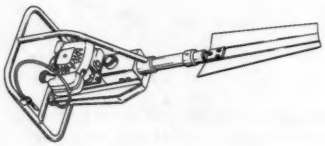


287,365
STAND FOR COMPUTER DISK DRIVE
Thomas W. Judd, Peterborough, N.H., assignor to Curtis Manufacturing Company, Inc., Peterborough, N.H.
Filed Dec. 9, 1983, Ser. No. 559,719
Term of patent 14 years
U.S. Cl. D14—114

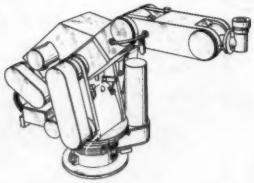


287,366
SOCK
Carl E. Hagen, New York, N.Y., assignor to Chipman-Union, Inc., Union Point, Ga.
Filed Oct. 19, 1983, Ser. No. 543,504
Term of patent 14 years
U.S. Cl. D2—331

287,367
MOTORIZED SHOVEL
Gerald Woods, Franklin, N.C., assignor to Blue Ridge Industrial Support Company, Swannanoa, N.C.
Filed Sep. 27, 1984, Ser. No. 654,965
Term of patent 14 years
U.S. Cl. D15—12

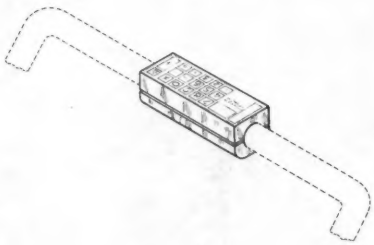


287,368
INDUSTRIAL ROBOT
Masato Shibayama, Sayama; Takeshi Abe, Tokyo; Daijiro Ida, Narashino; Masayuki Ohshiro, Narashino; Ichiro Takahashi, Narashino; Yasuhiro Hashimoto, Chiyoda; Humio Hujisawa, Mito, and Takeshi Araya, Higashikurume, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 6, 1984, Ser. No. 577,498
Claims priority, application Japan, Oct. 26, 1983, 58-46263; Oct. 26, 1983, 58-46264; Oct. 26, 1983, 58-46265
Term of patent 14 years
U.S. Cl. D15—199

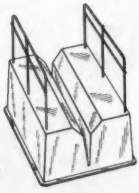


287,369
BINOCULAR
Heinrich Janke, Braunfels; Alfred Hengst, Lahnau, and Hans-Kurt Uellenberg, Edingen, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar G.m.b.H., Wetzlar, Fed. Rep. of Germany
Filed May 3, 1984, Ser. No. 607,893
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1983, 5MR246
Term of patent 14 years
U.S. Cl. D16—133

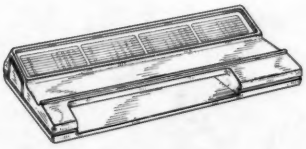
287,370
CALCULATOR FOR A SHOPPING CART
Scott A. Stoll, 3311 S. 88 E. Ave., Tulsa, Okla. 74145, and Mike Brennan, 9335 S. 65th East Pl., Tulsa, Okla. 74133
Filed Feb. 13, 1984, Ser. No. 579,383
Term of patent 14 years
U.S. Cl. D18—7



287,371
REFOLDING AND STACKING RECEPTACLE FOR SEGMENTAL SHEET MATERIAL
Jan T. Bekooy, 7670 SW. Barnard Dr., Beaverton, Oreg. 97007
Filed Nov. 9, 1984, Ser. No. 669,803
Term of patent 14 years
U.S. Cl. D18—22

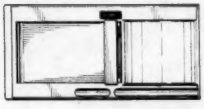


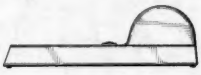
287,372
COMBINED HOLDER FOR NOTE PAPER AND A CALENDAR
Walter Henkels, Holunderweg 1, D-5145 Hückelhoven, Fed. Rep. of Germany
Filed Apr. 20, 1984, Ser. No. 602,531
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1984, MR 150
Term of patent 14 years
U.S. Cl. D19—22



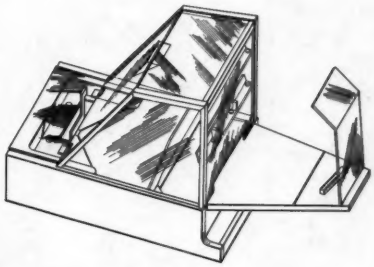
287,373
WRITING INSTRUMENT
Pierre Regnault, Valence, France, assignor to Etablissements Regnault, Valence, France
Filed Dec. 6, 1984, Ser. No. 678,804
Claims priority, application France, Jun. 6, 1984, 842,518
Term of patent 14 years
U.S. Cl. D19—43

287,374
MEMO PAPER HOLDER
William Macowski, Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed May 10, 1984, Ser. No. 608,734
Term of patent 14 years
U.S. Cl. D19—89

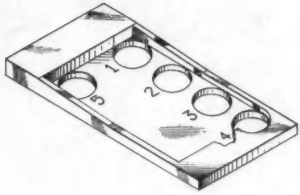




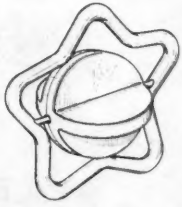
287,375
BASEBALL GAME HOUSING
Benjamin D. Suarez, 2000 - 49th St. NW., Canton, Ohio 44709
Filed Jan. 4, 1984, Ser. No. 568,246
Term of patent 14 years
U.S. Cl. D21—11



287,376
NOVELTY DIGITAL CALCULATOR
Marvin L. Emmons, 1029 Wisteria Trail, Austin, Tex. 78753
Filed Apr. 13, 1984, Ser. No. 599,960
Term of patent 14 years
U.S. Cl. D21—59



287,377
STAR TEETHER TOY
Lawrence B. Grubb, Monkton, Md., and David M. Williams, New York, N.Y., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.
Filed Jul. 16, 1984, Ser. No. 631,275
Term of patent 14 years
U.S. Cl. D21—65



287,378

RECONFIGURABLE JET-PLANE TOY

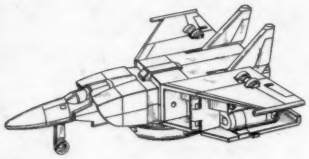
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

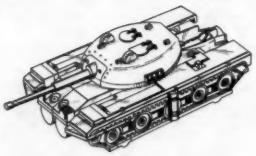
Filed Sep. 27, 1984, Ser. No. 655,327

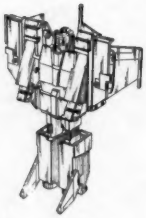
Claims priority, application Japan, May 25, 1984, 59-21295

Term of patent 14 years

U.S. Cl. D21—87







287,379

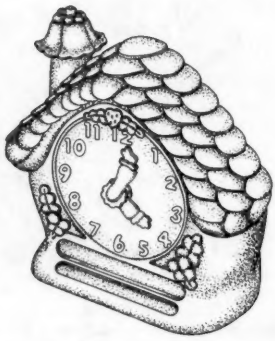
TOY CLOCK

Russell C. Edmisson, Manhattan Beach, Calif.; Charlotte A. Eicher, Fort Mitchell, Ky., and Stephen M. Toth, Cincinnati, Ohio, assignors to American Greetings Corporation, Cleveland, Ohio

Filed Aug. 15, 1984, Ser. No. 640,909

Term of patent 14 years

U.S. Cl. D21—109



287,380

TOY TELEPHONE

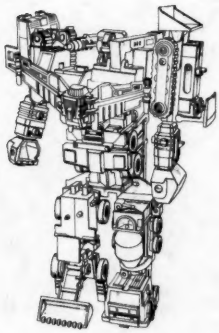
Kathryn A. Cavnar, Covington, Ky., and Stephen M. Toth, Loveland, Ohio, assignors to American Greetings Corporation, Cleveland, Ohio

Filed Jul. 9, 1984, Ser. No. 629,136

Term of patent 14 years

U.S. Cl. D21—111

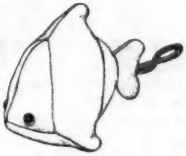
287,381
ASSEMBLED HUMANOID ROBOT TOY
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Sep. 4, 1984, Ser. No. 647,227
Term of patent 14 years
U.S. Cl. D21—150



287,382
NOVELTY TOOTH FIGURE
James C. Anastassiades, 1604 Lawrence Rd., Havertown, Pa. 19083, and Elliott D. Maser, 3101 Bristol Rd., Bensalem, Pa. 19020
Filed Feb. 29, 1984, Ser. No. 584,758
Term of patent 14 years
U.S. Cl. D21—155

287,383
TOY FUR SEAL
Akito Sato, Aichi, Japan, assignor to Pilot Ink Co., Ltd., Aichi, Japan
Filed Aug. 2, 1984, Ser. No. 637,175
Term of patent 14 years
U.S. Cl. D21—157

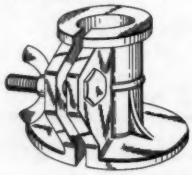
287,384
TOY ANGELFISH
Akito Sato, Aichi, Japan, assignor to Pilot Ink Co., Ltd., Aichi, Japan
Filed Aug. 2, 1984, Ser. No. 637,231
Term of patent 14 years
U.S. Cl. D21—157

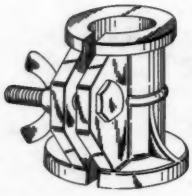


287,385
TOY CRAB
Akito Sato, Aichi, Japan, assignor to Pilot Ink Co., Ltd., Aichi, Japan
Filed Aug. 2, 1984, Ser. No. 637,365
Term of patent 14 years
U.S. Cl. D21—157

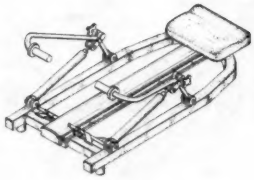
287,386
DOLL HOLDER
Thomas P. Kaiser, and Philip P. Kaiser, Jr., both of Northbrook, Ill., assignors to Kaiser Manufacturing Co., Chicago, Ill.
Filed Apr. 30, 1984, Ser. No. 605,233
Term of patent 14 years
U.S. Cl. D21—189

287,387
COLLAR FOR BARBELL OR SIMILAR ARTICLE
Morris A. Oliver, and Reginald R. Bell, both of Auckland, New Zealand, assignors to Don Oliver Barbell (1977) Limited, Auckland, New Zealand
Continuation of Ser. No. 477,527, Mar. 21, 1983, abandoned.
This application Jan. 7, 1986, Ser. No. 816,810
Claims priority, application New Zealand, Sep. 27, 1982, 17955 27
Term of patent 14 years
U.S. Cl. D21—191

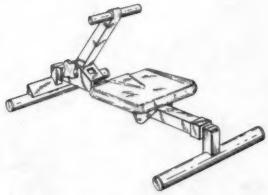




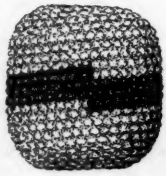
287,388
ROWING EXERCISE MACHINE OR SIMILAR ARTICLE
William Cheng, Taipei, Taiwan, assignor to Michael Hung, Taipei, Taiwan
Filed Sep. 25, 1984, Ser. No. 654,117
Term of patent 14 years
U.S. Cl. D21—195



287,389
TOY EXERCISING MACHINE
Richard P. Nadeau, Frankfort, N.Y., assignor to Zorcom Enterprise, Inc., Utica, N.Y.
Filed May 29, 1985, Ser. No. 738,753
Term of patent 14 years
U.S. Cl. D21—195



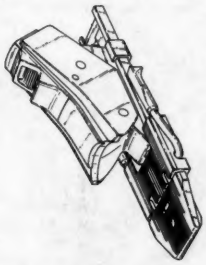
287,390
SEAMLESS CROCHET GAME FOOTBAG
Mark E. Charles, and Stephan J. Connella, both of 1278 Glenneyre, #96, Laguna Beach, Calif. 92651
Filed Jun. 6, 1984, Ser. No. 617,888
Term of patent 14 years
U.S. Cl. D21—204



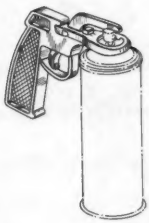
287,391
PUTTER HEAD
William B. Shearer, 2905 W. Main St., Muncie, Ind. 47305
Filed Apr. 9, 1984, Ser. No. 598,498
Term of patent 14 years
U.S. Cl. D21—219

287,392
GOLF CLUB HEAD COVER
Stephen L. Brittner, and Maureen F. Brittner, both of 4453 Poplar Road, Yarrow, BC V0Y 2A0, Canada
Filed Jul. 20, 1984, Ser. No. 633,038
Term of patent 14 years
U.S. Cl. D21—221

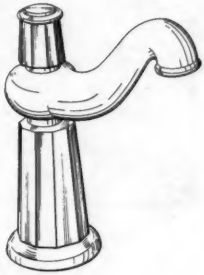
287,393
HEEL ELEMENT FOR SKI BINDING
Herbert H. Schultes, Fürstenfeldbruck, and Edwin Wahl, Munich, both of Fed. Rep. of Germany, assignors to Marker International Company, Salt Lake City, Utah
Filed May 3, 1982, Ser. No. 374,637
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1981, MR 18676
Term of patent 14 years
U.S. Cl. D21—230



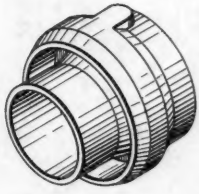
287,394
SPRAY GUN FOR AEROSOL CAN
Soichiro S. Yamamoto, 32 Charade Court, Agincourt, Ontario, Canada M1W 1C8
Filed Aug. 26, 1983, Ser. No. 526,797
Term of patent 14 years
U.S. Cl. D23—18



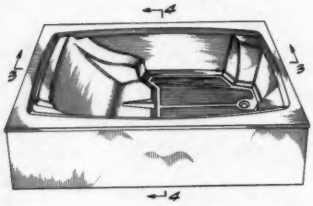
287,395
FAUCET SPOUT
Nazzareno Piesco, Milan, Italy, assignor to F.I.R. Rubinetterie S.p.A., Milan, Italy
Filed Apr. 24, 1984, Ser. No. 603,385
Claims priority, application Italy, Dec. 6, 1983, 23769/83[U]
Term of patent 14 years
U.S. Cl. D23—32



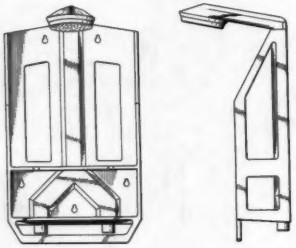
287,396
COMPRESSION SEALING GASKET FOR A LIQUID-TIGHT FITTING
Sami Shemtov, Brooklyn, N.Y., assignor to Berger Industries, Inc., Maspeth, N.Y.
Filed May 9, 1983, Ser. No. 492,871
Term of patent 14 years
U.S. Cl. D23—47



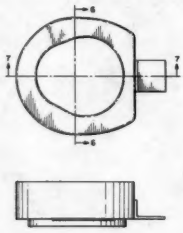
287,397
BATHTUB
Richard J. Cuttriss, Fillmore, Calif., assignor to Gruber Systems, Inc., Valencia, Calif.
Filed Nov. 8, 1984, Ser. No. 669,643
Term of patent 14 years
U.S. Cl. D23—55



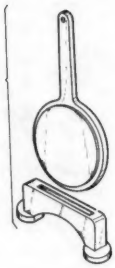
287,398
PORTABLE SHOWER
Myles A. Fisher, and Joseph S. Justin, both of 308 E. Government St., Pensacola, Fla. 32501
Filed Jul. 6, 1983, Ser. No. 511,192
Term of patent 14 years
U.S. Cl. D23—57



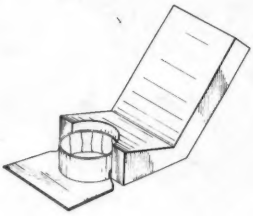
287,399
RAISED SUPERIMPOSED TOILET SEAT OR THE LIKE
John Broeils, Wycoff, N.J., assignor to Maddak, Inc., Pequannock, N.J.
Filed Sep. 23, 1982, Ser. No. 422,469
Term of patent 14 years
U.S. Cl. D23—71



287,400
DECORATIVE DUST SHIELD FOR A FIREPLACE ASH CONTAINER AND STAND THEREFOR
Randall B. Long, 3715 Cornell, Dearborn, Mich. 48124
Filed Mar. 23, 1984, Ser. No. 592,488
Term of patent 14 years
U.S. Cl. D23—131



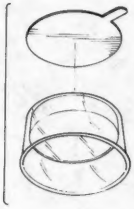
287,401
COMBINATION OBSTECTRICAL CHAIR AND COVER
Sanford L. Simons, 9188 S. Turkey Creek Rd., Morrison, Colo. 80465
Filed May 5, 1983, Ser. No. 491,745
Term of patent 14 years
U.S. Cl. D24—3



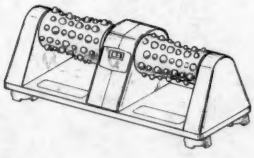
287,402
NOZZLE FOR A SUCTION DRAINAGE DEVICE FOR PERFORMING SURGERY IN THE MOUTH
Ernst L. Orsing, Missionsgatan 12, S-253 70 Helsingborg, Sweden
Filed Jun. 17, 1983, Ser. No. 505,502
Term of patent 14 years
U.S. Cl. D24—10

287,403
PULSE RECEIVER
Heikki Kiiski, Turku; Seppo Säynäjäkangas, Kempele; Martti Karppinen, and Tapio Tammi, both of Oulu, all of Finland, assignors to Polar Electro KY, Kempele, Finland
Filed Jun. 4, 1984, Ser. No. 616,840
Term of patent 14 years
U.S. Cl. D24—17

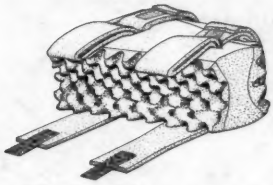
287,404
MEDICINE DISPENSING CUP
Jan-Erik Johansson, Räfsta, Vallentuna, Sweden 18600, and Håkan K. Bergkvist, Beckombergavägen 72, Bromma, Sweden 161 53
Filed Jul. 26, 1983, Ser. No. 517,301
Claims priority, application Sweden, Jan. 26, 1983, 830209
Term of patent 14 years
U.S. Cl. D24—34



287,405
ELECTRIC MASSAGER
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Tetumi Fujiyama, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Japan
Filed Dec. 8, 1983, Ser. No. 559,537
Claims priority, application Japan, Aug. 23, 1983, 58-36652
Term of patent 14 years
U.S. Cl. D24—40

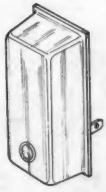


287,406
HIP ABDUCTION PILLOW
Linda H. Dixon, 1221 Andersen Dr., San Rafael, Calif. 94901
Filed Feb. 3, 1984, Ser. No. 576,669
Term of patent 14 years
U.S. Cl. D24—64

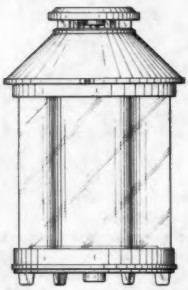


287,407
FLUORESCENT LAMP
Toshiharu Fujita, Kanagawa; Yoshihiro Domon, Kamakura, and Fuminobu Takizawa, Yokohama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 15, 1984, Ser. No. 661,158
Claims priority, application Japan, Apr. 27, 1984, 59-17362; Apr. 27, 1984, 59-17363
Term of patent 14 years
U.S. Cl. D26—3

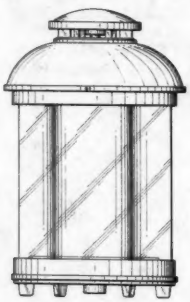
287,408
SENSOR NIGHT LIGHT
Donald R. Gaines, 26165 Hidden Valley Dr., Farmington Hill, Mich. 48018
Filed Feb. 15, 1983, Ser. No. 466,620
Term of patent 14 years
U.S. Cl. D26—26



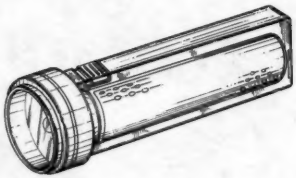
287,409
LANTERN
Lars-Gunnar Johansson, Paris, France, assignor to Architectural Structures Inc., London, England
Filed May 24, 1983, Ser. No. 497,663
The portion of the term of this patent subsequent to Dec. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—40



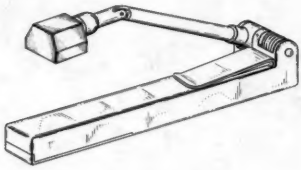
287,410
LANTERN
Lars-Gunnar Johansson, Paris, France, assignor to Architectural Structures Inc., London, England
Filed Dec. 19, 1983, Ser. No. 563,180
The portion of the term of this patent subsequent to Dec. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—40



287,411
HAND TORCH
John H. Drane, London, England, assignor to Duracell Inc., Bethel, Conn.
Filed May 7, 1984, Ser. No. 607,538
Claims priority, application United Kingdom, Nov. 21, 1983, 1016436
Term of patent 14 years
U.S. Cl. D26—46

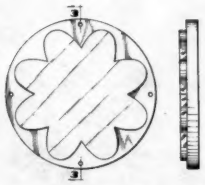


287,412
PORTABLE READING LIGHT
May Fung, Hong Kong, Hong Kong, assignor to Etna Products Co., Inc., New York, N.Y.
Filed May 4, 1984, Ser. No. 607,151
Claims priority, application United Kingdom, Mar. 30, 1984, 1018839
Term of patent 14 years
U.S. Cl. D26—60

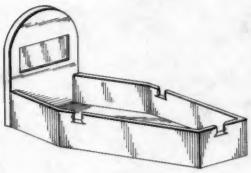


287,413
TRACK LIGHT FIXTURE
Raymond J. Kusmer, Elgin, and Raymond K. Tinley, Mt. Prospect, both of Ill., assignors to Cooper Industries, Inc., Houston, Tex.
Filed Feb. 10, 1984, Ser. No. 578,871
Term of patent 14 years
U.S. Cl. D26—65

287,414
HEADLIGHT COVER
Diane A. Giles, and Joseph Giles, both of 2359 Miriam La., Decatur, Ga. 30032
Filed Sep. 4, 1984, Ser. No. 646,821
Term of patent 14 years
U.S. Cl. D26—139

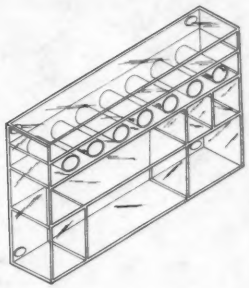


287,415
ASHTRAY
Charles W. Cramer, 13496 Pike Lake Trail NE., Prior Lake, Minn. 55372
Filed Apr. 29, 1985, Ser. No. 728,526
Term of patent 14 years
U.S. Cl. D27—22

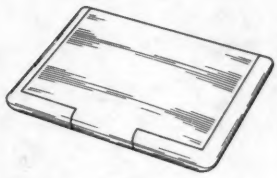


287,416
TWEEZERS
William D. Smith, 2335 32nd St., Moline, Ill. 61265
Filed Aug. 14, 1984, Ser. No. 640,739
Term of patent 14 years
U.S. Cl. D28—55

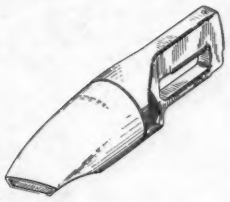
287,417
COSMETIC TRAY OR SIMILAR ARTICLE
Elizabeth H. Mocek, 602 Hickory Dr., Lafayette, La. 70503
Filed Jun. 25, 1984, Ser. No. 624,212
Term of patent 14 years
U.S. Cl. D28—76



287,418
CASE FOR COSMETIC PRODUCTS
Roberto Trabattoni, Petit-Lancy, Switzerland, assignor to Trasi S.A., Petit-Lancy, Switzerland
Filed Aug. 14, 1984, Ser. No. 640,689
Term of patent 14 years
U.S. Cl. D28—83



287,419
HAND-HELD VACUUM CLEANER
Gabriel T. Y. Ling, Tsuen Wan, Hong Kong, assignor to Conair Corporation, Edison, N.J.
Filed Apr. 16, 1984, Ser. No. 600,777
Term of patent 14 years
U.S. Cl. D32—18



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF DECEMBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Friedr. Flender GmbH & Co. KG: *See*—
Hellerhoff, Josef; Bunse, Peter; and te Beest, Hans, 4,630,349, Cl. 29-434.000.

AB Jonkoping Vulcan: *See*—
Severin, Eric; Jansson, Arne; and Ostman, Kjell, 4,630,734, Cl. 206-461.000.

AB Megaron: *See*—
Lovgren, Anders, 4,630,552, Cl. 110-190.000.

Abdala, Julio, Jr.; and Gasparaitis, Bernard V., to Motorola, Inc. LCD lightguide. 4,630,895, Cl. 350-345.000.

Abraham, Detlev: *See*—
Herrmann, Dietrich E.; and Abraham, Detlev, 4,631,467, Cl. 318-798.000.

ACF Industries, Incorporated: *See*—
Mandrell, Richard J., 4,630,981, Cl. 410-91.000.

Aciers et Outillage Peugeot: *See*—
Peugeot, Michel, 4,631,461, Cl. 318-280.000.

ACO Polymer Products, Inc.: *See*—
Karbstein, Peter, 4,630,966, Cl. 405-118.000.

Acorn Engineering Company: *See*—
Hafner, V. Walter; Hahn, Ron T.; and Marshall, Keith D., 4,630,638, Cl. 137-381.000.
Hafner, V. Walter; Hahn, Ron T.; Marshall, Keith D.; and Sally, Theodore J., 4,630,644, Cl. 137-624.110.

Adams, Gerald E.: *See*—
Ahmed, Israr; Adams, Gerald E.; Stratford, Ian J.; and Gibson, David, 4,631,289, Cl. 514-397.000.

Adams, William H., to Richards Technical Products, Inc. Monitoring apparatus. 4,630,449, Cl. 62-130.000.

Adler, Frank P., to Trans-Dyne, Incorporated. Bottom rod safety guard for railway brake rigging. 4,630,715, Cl. 188-210.000.

Advanced Micro Devices, Inc.: *See*—
Mazumder, Nikhil C.; and Yee, David H. B., 4,631,427, Cl. 307-455.000.

Advantest Corp.: *See*—
Shimizu, Masao, 4,631,724, Cl. 371-21.000.

AE PLC: *See*—
Blee, Timothy J.; and Deane, Norman P., 4,631,515, Cl. 340-62.000.

Aero-Vision Systems, Inc.: *See*—
Greenwald, Larry H., 4,630,821, Cl. 273-85.00G.

Aerospatiale Societe Nationale Industrielle: *See*—
Leman, Jean-Luc; Russier, Michel V.; and Suzzi, Robert J., 4,630,998, Cl. 416-134.00A.

Agency of Industrial Science & Technology: *See*—
Ebata, Yoshihiro; Kose, Saburo; and Hayami, Ryozo, 4,631,099, Cl. 156-89.000.
Tomimasu, Takio; Noguchi, Tsutomu; Tanino, Hiroshi; and Sugiyama, Suguru, 4,631,743, Cl. 378-138.000.

Agfa Gevaert Aktiengesellschaft: *See*—
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Uytterhoeven, Herman; de Winter, Walter; Hoffarth, Gunther; and Richter, Wolfgang, 4,631,243, Cl. 430-114.000.

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Ahroni, Joseph M. Series-parallel connected miniature light set. 4,631,650, Cl. 362-249.000.

Ahs, Wilgot, to Erress. Backrest adjusting device. 4,630,865, Cl. 297-284.000.

Aikawa, Kunihiko: *See*—
Irimajiri, Shoichiro; Komuro, Katsusuke; and Aikawa, Kunihiko, 4,630,702, Cl. 180-215.000.

Airwick Industries, Inc.: *See*—
Mandon, Jean-Pierre; and Rapiteau, Jean, 4,630,775, Cl. 239-56.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Nishii, Michiharu, 4,630,525, Cl. 91-369.00A.

Aisin-Warner Limited: *See*—
Sakakibara, Shiro, 4,630,723, Cl. 192-105.0BA.

Ajland, Kenth J. Frequency-matched signal device for persons with impaired hearing. 4,631,517, Cl. 340-326.000.

Akahori, Kazuyuki: *See*—
Masumoto, Mituhiko; Yanada, Shigeo; Izumida, Toshiaki; and Akahori, Kazuyuki, 4,631,334, Cl. 528-202.000.

Akamatsu, Naruhiko: *See*—
Maeda, Hirofumi; Watanabe, Kazuyoshi; Akamatsu, Naruhiko; Senda, Kenichi; and Nishioka, Shunichi, 4,631,159, Cl. 264-53.000.

Akasofu, Kyosuke; and Kuchiki, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Tool support synchronizing system for numerical control apparatus. 4,631,684, Cl. 364-474.000.

Akers, James B., Jr.; Leng, Douglas E.; and Normand, Randall J., to Dow Chemical Company, The. Preparation of chlorinated polyolefins. 4,631,175, Cl. 422-135.000.

Akesaka, Toshio; Suzuki, Kenju; and Sumi, Toshio, to Kabushiki Kaisha Iseki Kaihatsu Koki. Shield tunneling machine. 4,630,869, Cl. 299-33.000.

Akita, Yoshisuke; Tenmyo, Ichiro; Hayashi, Kiyoshi; Kihara, Kazuyuki; and Mito, Akio, to Tokyo Keiki Co., Ltd. Apparatus for controlling pressure and flow rate. 4,630,639, Cl. 137-486.000.

Aktiengesellschaft Adolph Saurer: *See*—
Windischbauer, Florian, 4,630,651, Cl. 139-446.000.

Akundi, Rama S.: *See*—
Inoue, Shinji; and Akundi, Rama S., 4,631,421, Cl. 307-297.000.

Al-Ko Products, Inc.: *See*—
Shifflett, David C.; and Shifflett, Dennis I., 4,631,212, Cl. 428-36.000.

Albany International Corporation: *See*—
Coplan, Myron J.; and Bilewski, Fred, 4,631,128, Cl. 210-321.500.

Alberta, Terry: *See*—
Spencer, Treesa; and Alberta, Terry, 4,630,600, Cl. 128-80.00R.

Albertini, Rocco D.: *See*—
Palmer, James E.; Albertini, Rocco D.; and Coladonato, Michael A., 4,630,522, Cl. 89-1.140.

Albery, Lewis L., to Cooperative Marketing Co., The. Brochure holder and blank therefor. 4,630,731, Cl. 206-425.000.

Alcan International Limited: *See*—
Turner, John H. W., 4,631,087, Cl. 106-252.000.

Alenax Corp.: *See*—
Seol, Marn T., 4,630,839, Cl. 280-255.000.

Alexander, James O.; King, William A.; May, William E.; and Pardue, Von G., to Siemens Energy & Automation, Inc. Microprocessor controlled circuit breaker trip unit. 4,631,625, Cl. 361-94.000.

Alfano, Robert R.: *See*—
Schiller, Norman H.; and Alfano, Robert R., 4,630,925, Cl. 356-318.000.

Allan, Barry D., to United States of America, Army. Afterburning reduction. 4,630,683, Cl. 169-45.000.

Allen Engineering Corporation: *See*—
Allen, J. Dewayne, 4,630,964, Cl. 404-96.000.

Allen, J. Dewayne, to Allen Engineering Corporation. Subgrading machine. 4,630,964, Cl. 404-96.000.

Alletto, Darro F. Drum head retainer. 4,630,521, Cl. 84-413.000.

Allied Colloids Ltd.: *See*—
Dymond, Brian, 4,631,137, Cl. 252-8.514.

Allied Corporation: *See*—
Arii, Kazuhiro; Yamamoto, Yasuo; Sumida, Nobuyuki; Hanaoka, Katsumi; and Tanaka, Kazuhiro, 4,631,509, Cl. 336-92.000.
Malka, Jacob H.; and Friedlander, Mordechai, 4,631,484, Cl. 328-63.000.
Steer, John E., 4,630,443, Cl. 60-535.000.

Allmandinger, Donald D.; and Pifer, Richard L., to Dana Corporation. Drive axle and method of assembling same. 4,630,506, Cl. 74-713.000.

Aloka Co., Ltd.: *See*—
Uchida, Rokuroh; Nagasaki, Katsuhiko; Miyake, Yasunori; Ohno, Michio; Takeichi, Hitoshi; and Matsumoto, Hiroji, 4,630,612, Cl. 128-660.000.

Altenheiner, Erwin; Schlicht, Gunther; and Hornschu, Joachim, to Carl-Zeiss-Stiftung. Binocular telescope with central control. 4,630,901, Cl. 350-552.000.

Altomare, Carol A., to Engelhard Corporation. Method of making seed solution useful in zeolite catalyst manufacture. 4,631,262, Cl. 502-65.000.

Aluminum Company of America: *See*—
Novak, John W., Jr.; Raines, Dennis R.; and Bray, Donald J., 4,630,665, Cl. 164-97.000.

Alwerud, Goran S.: *See*—
Park, Kyong; and Alwerud, Goran S., 4,630,473, Cl. 73-161.000.

Amann, Markus: *See*—
Thomann, Roland; Witschi, Heinz; Brink, Heinz-Deiter; and Amann, Markus, 4,630,962, Cl. 404-2.000.

Amano, Noboru: *See*—
Ikawa, Yasuo; Shibata, Tadashi; Urui, Kiyoshi; Miyata, Misao; Kawamura, Masahiko; and Amano, Noboru, 4,631,686, Cl. 364-490.000.

Amdahl Corporation: *See*—
Woffinden, Gary A.; Amdahl, Gene M.; and Hanson, Donald L., 4,631,660, Cl. 364-200.000.

Amdahl, Gene M.: *See*—
Woffinden, Gary A.; Amdahl, Gene M.; and Hanson, Donald L., 4,631,660, Cl. 364-200.000.

American Cyanamid Company: *See*—
Parekh, Girish G.; and Blank, Werner J., 4,631,320, Cl. 525-452.000.

Ritter, Thomas A.; Bray, James C.; and Kaganov, Alan L., 4,630,617, Cl. 128-784.000.
American Hoechst Corporation: *See—*
Caines, R. Scott, 4,631,155, Cl. 264-22.000.
Goode, Sidney H., 4,630,492, Cl. 73-863.820.
American Home Products Corporation: *See—*
Hung, Paul P., 4,631,290, Cl. 514-450.000.
American Microsystems, Inc.: *See—*
Riebeek, G. Fred, 4,631,429, Cl. 307-490.000.
Ametani, Minoru, to Nitto Electric Industrial Co., Ltd. Process for peeling protective film off a thin article. 4,631,103, Cl. 156-241.000.
AMF Union Machinery Inc.: *See—*
Seiling, Samuel O., 4,630,930, Cl. 366-77.000.
Amici, Francis R.; Farrington, Richard I.; and Piazza, Pietro, to Coleco Industries, Inc. Liquid squirting creature. 4,630,756, Cl. 222-78.000.
Amoco Corporation: *See—*
Zychal, Craig, 4,631,145, Cl. 252-321.000.
AMP Incorporated: *See—*
Korsunsky, Iosif; and Grabbe, Dimitry, 4,630,875, Cl. 339-17.0CF.
Renn, Robert M.; and Shoemaker, John R., 4,630,874, Cl. 339-17.00F.
Ampex Corporation: *See—*
Gabriel, Steven A.; and Evans, Lawrence J., 4,631,750, Cl. 382-41.000.
O'Gwynn, David C., 4,631,605, Cl. 360-70.000.
Anderson, Karen L.; Mintzer, Frederick C.; and Goertzel, Gerald. Method for enlarging a binary image. 4,631,751, Cl. 382-47.000.
Anderson, Richard N., to Hunter Douglas Inc. Honeycomb structure with Z-folded material and method of making same. 4,631,217, Cl. 428-118.000.
Anderson, Richard W.; Asik, Joseph R.; Ronzi, Richard C.; and Simko, Aladar O., to Ford Motor Company. Blast gap ignition system. 4,631,451, Cl. 315-209.00R.
Ando, Hideo, to Tokyo Shibaura Denki Kabushiki Denki. Optical apparatus for detecting the focusing state and positional accuracy of a light beam directed onto an optical disk tracking guide in an optical read/write system. 4,631,395, Cl. 250-201.000.
Andren, Kjell: *See—*
Duckman, Donald; Duckman, Curt; and Andren, Kjell, 4,630,564, Cl. 114-98.000.
Andrews, Beatrice M.; Carr, Neil; Gray, George W.; and Hogg, Christine, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Liquid crystal compounds. 4,630,897, Cl. 350-350.00R.
Andrews, D. Marshall, to Harris Corporation. High density packaging technique for electronic systems. 4,631,636, Cl. 361-385.000.
Andrews, Henry L.; and Gardiner, Gregory E., to Pfizer Hospital Products Group Inc. Cobalt-chromium superalloy. 4,631,082, Cl. 75-235.000.
Angermuller, Helmut; and Hahlganss, Gunther, to VDO Adolf Schindling AG. Information input. 4,631,678, Cl. 364-424.000.
Anscherlik, Arnost. Device for dispensing doses of liquid. 4,630,753, Cl. 222-17.000.
Antico, Michael: *See—*
Coviello, Frank; and Antico, Michael, 4,631,367, Cl. 379-157.000.
Aoki, Akio, to Trion Corporation. Baseball catching means. 4,630,318, Cl. 2-19.000.
Aoshima, Kazuyoshi: *See—*
Kobayashi, Michio; Yoshida, Masato; Sawada, Hideo; Hagii, Hidehiko; and Aoshima, Kazuyoshi, 4,631,151, Cl. 260-408.000.
Aoyama, Shuki, to Kabushiki Kaisha Toshiba. High-frequency heating device having rotatable tray and high frequency wave agitator. 4,631,379, Cl. 269-10.55F.
Aozuka, Torao: *See—*
Nishigaki, Susumu; Ohkoshi, Akio; and Aozuka, Torao, 4,630,826, Cl. 273-167.00H.
Aramaki, Jun: *See—*
Fukunaga, Tokio; Magara, Takuji; Sakabe, Shigekazu; Aramaki, Jun; Karashima, Toshiharu; and Ushida, Minoru, 4,631,382, Cl. 219-69.00R.
Arber, Amihadar. Calendar with indicating means. 4,630,934, Cl. 368-28.000.
Arii, Kazuhiro; Yamamoto, Yasuo; Sumida, Nobuyuki; Hanaoka, Katsumi; and Tanaka, Kazuhiro, to Allied Corporation. Electrical induction apparatus with support inside casing. 4,631,509, Cl. 336-92.000.
Arimura, Yoshiaki; Obama, Masao; and Hitomi, Yutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Multi-joint arm robot apparatus. 4,631,689, Cl. 364-513.000.
Armstrong, Donald J.; Giacomazzi, Roy A.; and Niepoth, George W., to General Motors Corporation. Fuel fill tube with vapor vent and overfill protection. 4,630,749, Cl. 220-86.00R.
Armstrong International, Inc.: *See—*
Vallery, Stafford J., 4,630,633, Cl. 137-185.000.
Arntsen, Tom D.; Embree, Milton L.; Havens, Joseph H.; and Toumani, Rouben, to AT&T Bell Laboratories. Low resistance origination scan circuit. 4,631,362, Cl. 379-384.000.
Arola, Rodger A.; and Sall, Hans-Olof, to United States of America, Agriculture. Counter rotating double disc chunker. 4,630,658, Cl. 144-176.000.
Arroyo, Juan. Surgical instrumentation including a clamp assembly to facilitate attachment of blood vessel sections. 4,630,608, Cl. 128-335.000.
Aruga, Tamotsu: *See—*
Kawanishi, Toshiyuki; Shimada, Masaru; Murakami, Kakuji; Aruga, Tamotsu; and Uemura, Hiroyuki, 4,631,085, Cl. 106-22.000.
Asahi Glass Company Ltd.: *See—*
Yamabe, Masaaki; Kobayashi, Shigeyoshi; Yoshihara, Noriyuki; and Nakamura, Masaru, 4,631,075, Cl. 55-158.000.
Asahi, Hidetoshi: *See—*
Takino, Kiyoko; Asahi, Hidetoshi; and Wada, Hiroshi, 4,631,255, Cl. 435-37.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Fukui, Tsutomu, 4,631,600, Cl. 358-320.000.
Asaoka, Ryuji; and Nagao, Yasuhiro, to Nippondenso Co., Ltd. Internal combustion engine starter having laminated plates simultaneously forming the switch yoke and the motor yoke. 4,631,434, Cl. 310-112.000.
Asea Aktiebolag: *See—*
Olsson, Karl-Erik, 4,631,656, Cl. 363-123.000.
Ashkin, Arthur; and Stolen, Rogers H., to AT&T Bell Laboratories. Exposed core optical fibers, and method of making same. 4,630,890, Cl. 350-96.300.
Asik, Joseph R.: *See—*
Anderson, Richard W.; Asik, Joseph R.; Ronzi, Richard C.; and Simko, Aladar O., 4,631,451, Cl. 315-209.00R.
Asmussen, Jes; and Reinhard, Donnie K., to Board of Trustees operating Michigan State University. Microwave or UHF plasma improved apparatus. 4,630,566, Cl. 118-50.100.
Asulab S.A.: *See—*
Leuenberger, Claude-Eric, 4,630,936, Cl. 368-66.000.
AT&T Bell Laboratories: *See—*
Arntsen, Tom D.; Embree, Milton L.; Havens, Joseph H.; and Toumani, Rouben, 4,631,362, Cl. 379-384.000.
Ashkin, Arthur; and Stolen, Rogers H., 4,630,890, Cl. 350-96.300.
Campbell, Joe C.; and Dentai, Andrew G., 4,631,566, Cl. 357-30.000.
Dragone, Corrado, 4,631,545, Cl. 343-779.000.
Federico, Joseph; and Waaben, Sigurd G., 4,631,355, Cl. 178-18.000.
Foschini, Gerard J., 4,631,734, Cl. 375-15.000.
Foster, Robert W.; and Weekly, Max D., 4,631,363, Cl. 379-15.000.
Fouad, Fakhry A.; Kakalec, Robert J.; and Menkes, Henry E., 4,631,471, Cl. 323-306.000.
Lauriello, Philip J. J.; and Slavin, Lawrence M., 4,630,886, Cl. 350-96.200.
LoCicero, Joseph L.; Pazarci, Melih; and Rzeszewski, Theodore S., 4,631,574, Cl. 358-12.000.
AT&T Information Systems Inc.: *See—*
Coyne, Joan H.; Dooling, David J.; Miller, Louis E.; and Nalbone, Robert D., 4,631,364, Cl. 379-164.000.
Franklin, Andrew D.; Hasley, Lloyd A.; and Smith, James E., 4,631,534, Cl. 340-825.500.
AT&T Technologies, Inc.: *See—*
Clark, Harold R.; and Nicol, David A., 4,631,079, Cl. 65-109.000.
Atecs Corporation: *See—*
Grant, Richard W.; and Sciulli, Ronald D., 4,630,562, Cl. 114-39.000.
Atkin, Graham E., to Austin Rover Group Limited. Internal combustion engine. 4,630,579, Cl. 123-195.00R.
Atlantic Research Corporation: *See—*
Scheffee, Robert S., 4,630,556, Cl. 110-347.000.
Atlas, Dan. Apnea monitoring apparatus. 4,630,614, Cl. 128-721.000.
Attwell, Ronald L., to Selkirk Division of Household Manufacturing Limited. Fire stop. 4,630,415, Cl. 52-221.000.
Aubrecht, Richard A., to Moog Inc. Linear force motor. 4,631,430, Cl. 310-12.000.
Auburn International, Inc.: *See—*
Newton, Robert E.; and Girgenti, Russell S., 4,631,482, Cl. 324-454.000.
Audio Precision, Inc.: *See—*
Cabot, Richard C., 4,631,522, Cl. 340-347.0CC.
Ausmus, Dee H., Jr. Earth scraper for use with a small tractor. 4,630,686, Cl. 172-393.000.
Ausprung, Erich, to Springfix-Befestigungstechnik GmbH. Ball cup for a ball bearing. 4,630,957, Cl. 403-76.000.
Austin Rover Group Limited: *See—*
Atkin, Graham E., 4,630,579, Cl. 123-195.00R.
Auto Lokari Oy: *See—*
Venetjoki, Juhani T., 4,630,701, Cl. 180-209.000.
Automated Security Holdings, Ltd.: *See—*
Marsh, John C., 4,631,526, Cl. 340-396.000.
Automobiles Citroen: *See—*
Quin, Philippe P., 4,630,527, Cl. 91-449.000.
Automobiles Peugeot: *See—*
Quin, Philippe P., 4,630,527, Cl. 91-449.000.
Avery, Leslie R., to RCA Corporation. Zener diode structure. 4,631,562, Cl. 357-13.000.
Avondale Industries, Inc.: *See—*
Shah, Chandrakant K., 4,630,536, Cl. 100-229.00R.
Votava, Ronald, 4,630,461, Cl. 72-405.000.
Axelrod, Burton, to Axelrod R & D, Inc. Waste treatment device and method using microwaves. 4,631,133, Cl. 210-739.000.
Axelrod, Joan C.; and Chibnik, Sheldon, to Mobil Oil Corporation. Cold flow improving fuel additive compound and fuel composition containing same. 4,631,071, Cl. 44-71.000.
Axelrod R & D, Inc.: *See—*
Axelrod, Burton, 4,631,133, Cl. 210-739.000.
Ayano, Mitsutoshi: *See—*
Takato, Kenji; Ayano, Mitsutoshi; Shibuya, Kiyoshi; Iijima, Yoshimi; and Serikawa, Atsuo, 4,531,366, Cl. 340-333.000.

Azionaria Costruzioni Macchine Automatiche: *See*—
Kemnitz, Tadeusz F., 4,630,696, Cl. 177-165.000.

Baatz, Gunter: *See*—
Diehl, Hermann; Baatz, Gunter; and Machholz, Walter, 4,630,421, Cl. 52-408.000.

Babcock & Wilcox Company, The: *See*—
Barnes, Christine B., 4,630,631, Cl. 137-85.000.

Bachman, Charles W., to Bachman Information Systems, Inc. Partnership data base management system and method. 4,631,664, Cl. 364-200.000.

Bachman Information Systems, Inc.: *See*—
Bachman, Charles W., 4,631,664, Cl. 364-200.000.

Bade, Robert K., to Phillips Petroleum Company. Sample homogenizer. 4,630,469, Cl. 73-61.10C.

Baggen, Constant P. M. J.: *See*—
Kahlman, Josephus A. H. M.; and Baggen, Constant P. M. J., 4,631,714, Cl. 369-59.000.

Baillie, Lloyd A.: *See*—
Senese, Frank J.; and Baillie, Lloyd A., 4,630,467, Cl. 73-49.200.

Baker, Billey E.: *See*—
Galle, Edward M.; and Baker, Billey E., 4,630,689, Cl. 175-56.000.

Baker CAC: *See*—
Cutcher, Dennis R., 4,630,636, Cl. 137-315.000.

Baker, Ralph; Smith, Eric T.; Dickinson, Vaughan T.; McKenzie, Noel C.; and Hargreaves, Brian, to Ferodo Ltd.; and T&N Research Ltd. Manufacture of asbestos-free friction facing material. 4,631,209, Cl. 427-392.000.

Baker, Roy A.; Costello, Rocky C.; and Engel, Michael J., to Stauffer Chemical Company. Removal of sulfur from aqueous suspension using filtration. 4,631,068, Cl. 23-293.00S.

Balch, Richard A.: *See*—
Germer, Warren R.; and Balch, Richard A., 4,631,476, Cl. 324-103.00R.

Baldt Incorporated: *See*—
Palmer, James E.; Albertini, Rocco D.; and Coladonato, Michael A., 4,630,522, Cl. 89-1.140.

Ball, Randell D. Document storage container. 4,630,769, Cl. 232-1.00D.

Ballard, Paul T. Quasi-resonant random access deflection system for a calligraphic display monitor. 4,631,454, Cl. 315-408.000.

Ballast, Johan T. G.: *See*—
Furst, Leander; Ballast, Johan T. G.; and Jahnel, Kurt, 4,630,637, Cl. 137-340.000.

Ballato, Arthur, to United States of America, Army. Stress compensated piezoelectric crystal device. 4,631,437, Cl. 310-369.000.

Bambousek, Gerald J.; Bartlett, Donald S.; and Schmidt, Thomas D., to GMF Robotics Corporation. Spray paint system including paint booth, paint robot apparatus movable therein and rail mechanism for supporting the apparatus thereout. 4,630,567, Cl. 118-323.000.

Bammert, Hubert; Lahres, Hans; and Mosch, Egon, to Carl-Zeiss-Stiftung. Blank for eyeglass lenses having ellipse-like edge curves and means and method for selecting. 4,630,906, Cl. 351-159.000.

Bancroft, Lewis C.: *See*—
Chouinard, Michael P.; and Bancroft, Lewis C., 4,631,602, Cl. 360-16.000.

Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., to Ortho Pharmaceutical Corporation. Ortho substituted dihydroxy-2(1H)quinazolinone-1-alkanoic acids. 4,631,283, Cl. 514-259.000.

Bardhan, Pronob: *See*—
Lachman, Irwin M.; Bardhan, Pronob; and Nordlie, Lawrence A., 4,631,268, Cl. 502-439.000.

Barmag Barmer Maschinenfabrik AG: *See*—
Bauer, Karl; Hanisch, Michael; and Lenk, Erich, 4,630,340, Cl. 28-187.000.

Barnes, Christine B., to Babcock & Wilcox Company, The. Pneumatic servo assembly for an electro-pneumatic converter. 4,630,631, Cl. 137-85.000.

Barnes, Lawrence C.; and Mankedick, Robert G., to NCR Corporation. Apparatus and its method for the simultaneous presentation of computer generated graphics and television video signals. 4,631,588, Cl. 358-149.000.

Barsan, William G., to University E.M., Inc. Treatment of cerebral ischemia with dichloroacetate. 4,631,294, Cl. 514-557.000.

Bartlett, Donald S.: *See*—
Bambousek, Gerald J.; Bartlett, Donald S.; and Schmidt, Thomas D., 4,630,567, Cl. 118-323.000.

Bartos, Donald M.; and Gaul, John H., Jr., to Dow Corning Corporation. Process for preparing ceramic materials. 4,631,260, Cl. 501-88.000.

Bartsch, Uwe: *See*—
Keiler, Manfred; Bartsch, Uwe; Drosemeyer, Hans-Heinrich; and Reitsam, Franz X., 4,630,382, Cl. 34-173.000.

BASF Aktiengesellschaft: *See*—
Ringsdorf, Helmut; Portugall, Michael; Schmidt, Hans W.; and Etzbach, Karl H., 4,631,328, Cl. 526-259.000.
Steck, Werner; and Jakusch, Helmut, 4,631,140, Cl. 252-62.560.

Batalden, Glenn D.; Baxter, Duane W.; and Davie, Neil R., to International Business Machines Corporation. System for preventing the overwriting of previously optically recorded data and for reading optically recorded data during writing. 4,631,706, Cl. 365-215.000.

Battice, David R.; and Hales, Michael G., to Dow Corning Corporation. Antimicrobially effective organic foams and methods for their preparation. 4,631,297, Cl. 521-78.000.

Battisti, Angelo J.: *See*—
Minten, Karl L.; Battisti, Angelo J.; and Pismennaya, Galina, 4,631,117, Cl. 204-15.000.

Battistini, Carlo; Foglio, Maurizio; Franceschi, Giovanni; and Scarafile, Cosimo, to Farmitalia Carlo Erba S.p.A. Process for the preparation of penems. 4,631,150, Cl. 540-310.000.

Bauer, Alajos Z.; and Verespej, Michael A., to Burndy Corporation. Apparatus for installing electrical on flat conductor cable. 4,630,362, Cl. 29-751.000.

Bauer, Karl; Hanisch, Michael; and Lenk, Erich, to Barmag Barmer Maschinenfabrik AG. Apparatus for drawing a warp sheet of yarns. 4,630,340, Cl. 28-187.000.

Bauman, Therese M.; and Freiberg, Alan L., to Dow Corning Corporation. Method of producing a silicone water-based elastomer. 4,631,296, Cl. 521-65.000.

Baxter, Duane W.: *See*—
Batalden, Glenn D.; Baxter, Duane W.; and Davie, Neil R., 4,631,706, Cl. 365-215.000.

Baxter, Paul L., to Interox Chemicals Limited. Activation. 4,631,141, Cl. 252-95.000.

Baxter Travenol Laboratories, Inc.: *See*—
Bilstad, Arnold C.; and Brown, William C., 4,630,448, Cl. 62-60.000.
Christine, William C., 4,630,429, Cl. 53-479.000.
Olson, Raymond G., 4,631,007, Cl. 417-476.000.

Bayer Aktiengesellschaft: *See*—
Blahak, Johannes; Dhein, Rolf; Preis, Lothar; and Schreckenberg, Manfred, 4,631,319, Cl. 525-437.000.
Buding, Hartmuth; Fiedler, Paul; Konigshofen, Heinrich; and Thormer, Joachim, 4,631,315, Cl. 525-338.000.
Hartwig, Wolfgang; Habich, Dieter; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,631,275, Cl. 514-210.000.
Idel, Karsten; Ostlinning, Edgar; and Freitag, Dieter, 4,631,336, Cl. 528-388.000.
Konig, Joachim; and Korte, Siegfried, 4,631,317, Cl. 525-383.000.
Kraatz, Udo; Buchel, Karl H.; Hanssler, Gerd; Brandes, Wilhelm; and Reinecke, Paul, 4,631,288, Cl. 514-340.000.
Kricheldorf, Hans R.; Pakull, Ralf; and Dicke, Hans-Rudolf, 4,631,333, Cl. 528-170.000.
Lockhoff, Oswald; Kruger, Bernd-Wieland; Stadler, Peter; Metzger, Karl G.; Kroll, Hein-Peter; Schaller, Klaus; and Zeiler, Hans-Joachim, 4,631,272, Cl. 514-23.000.
Meyer, Karl-Heinrich; Hucks, Uwe; and Horsthemke, August, 4,631,338, Cl. 528-483.000.
Naumann, Rolf; Leitner, Lutz; Rademachers, Jakob; and Buxbaum, Gunter, 4,631,090, Cl. 106-304.000.
Rademachers, Jakob; Naumann, Rolf; and Teichmann, Gunther, 4,631,089, Cl. 106-304.000.
Stendel, Wilhelm; and Voege, Herbert, 4,631,231, Cl. 428-413.000.
Thormer, Joachim; Leibbrandt, Friedrich; Szentivanyi, Zsolt; and Buding, Hartmuth, 4,631,309, Cl. 524-426.000.
Wingler, Frank; Koch, Otto; Lindner, Christian; and Reinking, Klaus, 4,631,311, Cl. 525-67.000.

Bayerische Motoren Werke AG: *See*—
Bez, Ulrich, 4,630,858, Cl. 296-146.000.

BBC Brown, Boveri & Company, Limited: *See*—
Frutschi, Hansulrich, 4,630,436, Cl. 60-39.183.

Beane, Thomas F. Method of suppressing the effects of static electricity in a tumble drier for textile goods. 4,631,630, Cl. 361-212.000.

Beasley, Thomas R.; and Teng, Chuan C., to Dailey Petroleum Services Corp. Spiralling tapered slip-on drill string stabilizer. 4,630,690, Cl. 175-57.000.

Beck, James R., to Eli Lilly and Company. Cyanopyrazole intermediates. 4,631,343, Cl. 546-279.000.

Becker, John H. Air encasement system for transportation of particulates. 4,630,975, Cl. 406-85.000.

Bedard, James F.: *See*—
Thomas, Charles E.; Lee, Minyoung; Bedard, James F.; Hayashi, Steven R.; and Yerazunis, William S., 4,631,683, Cl. 364-474.000.

Bedford Engineering Co.: *See*—
Bradley, William P., 4,630,768, Cl. 229-92.700.

Beech, Brian H., to Independent Broadcasting Authority. Phase lock loop television signal demodulator. 4,631,487, Cl. 329-50.000.

Beecham Group Plc: *See*—
Cassidy, Frederick, 4,631,282, Cl. 514-254.000.

Beers, William W.; and Parham, Thomas G., to General Electric Company. Aluminate phosphor. 4,631,144, Cl. 252-301.40R.

Beiersdorf Aktiengesellschaft: *See*—
Engel, Walter; Hoppe, Udo; and Sauermann, Gerhard, 4,631,295, Cl. 514-558.000.
Stenzel, Wolfgang; and Hofferber, Eva, 4,631,281, Cl. 514-252.000.

Belanger, Germain: *See*—
Lalancette, Jean M.; and Belanger, Germain, 4,631,183, Cl. 423-659.000.

Belanger, Victor, to Monogram Industries, Inc. Tactile engaging wrenching mechanism. 4,630,510, Cl. 81-55.000.

Belcher, Henry. Cutting tool. 4,630,976, Cl. 407-65.000.

Bell Communications Research, Inc.: *See*—
Miller, Stewart E., 4,631,730, Cl. 372-50.000.

Bell, L. James, to O. Ruben Pettersson. Lock for sliding doors. 4,630,853, Cl. 292-258.000.

Bell, Thomas W.; and Shurman, Louis W., to Firestone Tire & Rubber Company, The. Tire construction utilizing low-twist body ply yarn with low turn-up ends. 4,630,663, Cl. 152-541.000.

Belleli, Riccardo, to Belleli S.p.A. Clamping assembly heat exchanger tube plates. 4,630,673, Cl. 165-158.000.

Belleli S.p.A.: *See*—
Belleli, Riccardo, 4,630,673, Cl. 165-158.000.

Beloit Corporation: *See*—
Mulfarth, Werner, 4,630,783, Cl. 242-56.00A.
Ng, David T.; and Brendemuehl, Roger C., 4,631,682, Cl. 364-471.000.
Belokin, Paul, Jr. Modular display stand. 4,630,740, Cl. 211-194.000.
Belthle, Heinz, to Schaudt Maschinenbau GmbH. Method and machine for grinding rotationally symmetrical workpieces. 4,630,403, Cl. 51-105.0VG.
Bend Research, Inc.: *See*—
Johnson, Bruce M., 4,631,157, Cl. 264-41.000.
Bender, Roland A.; Howarth, Lawrence R.; and Coar, Lawrence F. Low cost sonobuoy. 4,631,709, Cl. 367-4.000.
Bender, Rudolf; Dietrich, Hans-Gerd; and Giebel, Gerhard, to USM Corporation. Method of an apparatus for lasting sides of shoes on lasts, comprising a side tack insertion device. 4,630,325, Cl. 12-8.100.
Benedetti, Nicholas M.: *See*—
Osterland, Robert W.; and Benedetti, Nicholas M., 4,630,338, Cl. 24-293.000.
Beneze, Heinz W., to Firestone Tire & Rubber Company, The. Penetrating roofing mechanical fastening sealing system and method. 4,630,422, Cl. 52-410.000.
Bennett, Allyn N., to Du Pont de Nemours, E. I., and Company. Uniform cover sheet with rough surface in a photosensitive element. 4,631,246, Cl. 430-271.000.
Benson, Inc.: *See*—
Collins, Galen, 4,631,740, Cl. 377-76.000.
Berg, Lloyd; and Yeh, An-I. Dehydration of ethanol by extractive distillation. 4,631,115, Cl. 203-19.000.
Berg Steel Pipe Corp.: *See*—
Koehle, Siegfried E., 4,630,646, Cl. 138-96.00R.
Bergeron, Lawrence E.; Daly, Daniel F.; and Grosso, Elaine C., to Wang Laboratories, Inc. Compression and expansion of digitized voice signals. 4,631,746, Cl. 381-35.000.
Bergin, John A.; and Cangiano, Frank, to GTE Products Corporation. Replaceable automobile headlight lamp unit and automobile headlight utilizing same. 4,631,651, Cl. 362-267.000.
Bergstrom, Gary C.; and Lambert, Michael B., to United States of America, Agriculture. Method and instrument to estimate the weights of green trees and logs. 4,630,481, Cl. 73-437.000.
Bergwerksverband GmbH: *See*—
Wagener, Heinrich; Kirchhoff, Reinhold; Von Heek, Karl H.; and Juntgen, Harald, 4,630,479, Cl. 73-863.83.
Berkenhoff GmbH: *See*—
Dommer, Erich; and Groos, Heinrich, 4,631,237, Cl. 428-621.000.
Berkley and Company, Inc.: *See*—
Tretinyak, Carl W., 4,630,616, Cl. 128-753.000.
Berlin, Herbert, to Hauni-Werke Korber & Co. KG. Apparatus for testing rod-shaped articles of the tobacco processing industry. 4,630,466, Cl. 73-38.000.
Bernander, Karl-Gustav: *See*—
Engstrom, Bjorn M. H.; and Bernander, Karl-Gustav, 4,630,412, Cl. 52-1.000.
Bernet, Yvon: *See*—
Combourieu, Michel; Bernet, Yvon; Laigle, Jean-Claude; and Simbille, Nadine, 4,631,277, Cl. 514-239.000.
Bernstein, Robert E.; and Nelson, Alan E., to Larad Equipment Corporation. Flow device with resilient elastomeric sleeve. 4,630,635, Cl. 137-315.000.
Berry, Ivan L.: *See*—
Lucas, Ronald J.; Berry, Ivan L.; and Wolfe, John C., 4,631,704, Cl. 365-126.000.
Berthet, Hubert; Laugier, Noel; and Ricome, Bernard, to Institut Francais du Petrole. Realization procedure of a modular system particularly suitable for use off coasts. 4,630,968, Cl. 405-195.000.
Berthiez-Saint-Etienne: *See*—
Roux, Jean-Pierre, 4,630,979, Cl. 409-232.000.
Bertotti, Franco: *See*—
Foroni, Mario; and Bertotti, Franco, 4,631,561, Cl. 357-13.000.
Bertozzi, Albert. Plastic coated bowling pin. 4,630,820, Cl. 273-82.00R.
Beta B.V.: *See*—
Spa, Lambertus K. J., 4,630,645, Cl. 137-625.600.
Betterton, Joseph T.; and Glover, Alfred H., to Chrysler Motors Corporation. Transducer fastening device. 4,630,480, Cl. 73-431.000.
Betts, Robert E.: *See*—
Thorn, Lawrence B.; and Betts, Robert E., 4,630,539, Cl. 102-202.000.
Betts, William L.; and Zuranski, Edward, to Paradyne Corporation. Gain tracker for digital modem. 4,631,738, Cl. 375-98.000.
Betz, Wolfgang, to MTU Motoren- und Turbinen-Union Muenchen GmbH. Fluid flow engine, especially power engine acted upon by gas. 4,630,995, Cl. 416-7.000.
Bez, Ulrich, to Bayerische Motoren Werke AG. Multi-purpose passenger motor vehicle, especially station wagon. 4,630,858, Cl. 296-146.000.
Biale, John, to Union Oil Company of California. Bonding method employing composition for improved adhesion of vinylidene chloride latex to ionomer films. 4,631,235, Cl. 428-518.000.
Biasioli, Stefano: *See*—
Feriani, Mariano; and Biasioli, Stefano, 4,630,727, Cl. 206-221.000.
BICC Public Limited Company: *See*—
Taylor, John E., 4,630,887, Cl. 350-96.230.
Bickel, Karl L.: *See*—
Eberle, George F.; Bickel, Karl L.; and Denny, John M., 4,630,424, Cl. 52-693.000.
Bienert, Horst; and Kohlpaintner, Georg, to Webasto-Werk W. Baier GmbH & Co. Wind deflector arrangement for a motor vehicle roof. 4,630,859, Cl. 296-217.000.
Biermann, Eberhard; Nagele, Erwin; and Romann, Peter, to Robert Bosch GmbH. Flow rate meter. 4,630,487, Cl. 73-861.760.
Bierschenk, Thomas R., to Dow Chemical Company, The. Graphite composite chips. 4,631,200, Cl. 427-113.000.
Bilewski, Fred: *See*—
Coplan, Myron J.; and Bilewski, Fred, 4,631,128, Cl. 210-321.500.
Billings, Philip A.: *See*—
Figueira, Stephen; and Billings, Philip A., 4,630,722, Cl. 192-84.00T.
Bilstad, Arnold C.; and Brown, William C., to Baxter Travenol Laboratories, Inc. Container for storing solid living tissue portions. 4,630,448, Cl. 62-60.000.
Bingley, John D., to RCA Corporation. Current surge limited power supply. 4,631,470, Cl. 323-282.000.
Bio-Support Industries Ltd.: *See*—
Roberts, Frank L., 4,630,863, Cl. 297-219.000.
Biotechnology Research Partners, Ltd.: *See*—
Dale, Beverly; and Cordell, Barbara, 4,631,191, Cl. 424-88.000.
Biraud, Lucien, to Thomson CSF. Stud and a support for fixing an electronic component to a printed circuit board. 4,631,639, Cl. 361-417.000.
Bird, Graham J.: *See*—
Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; Conway, Richard J.; and Tucker, Peter G., 4,631,081, Cl. 71-94.000.
Birrittella, Mark S.; Reuss, Robert H.; and Seelbach, Walter C., to Motorola, Inc. Integrated circuit having buried oxide isolation and low resistivity substrate for power supply interconnection. 4,631,570, Cl. 357-49.000.
Bisbing, Robert H., to Southco, Inc. Adjustable friction plastic hinge having non-squeak properties. 4,630,332, Cl. 16-273.000.
Biziere, Kathleen: *See*—
Kan, Jean-Paul; Biziere, Kathleen; and Wermuth, Camille-Georges, 4,631,280, Cl. 514-247.000.
Bjurling, Anders, to Dynatrans Technology Ltd. Lifting yoke for containers. 4,630,855, Cl. 294-81.210.
Blackledge, Mick: *See*—
Winch, Peter C.; and Blackledge, Mick, 4,630,437, Cl. 60-204.000.
Blahak, Johannes; Dhein, Rolf; Preis, Lothar; and Schreckenberg, Manfred, to Bayer Aktiengesellschaft. Thermosetting cyanate resin and the use thereof for the production of composite materials and IPNs. 4,631,319, Cl. 525-437.000.
Blandy, Geoffrey O., to International Business Machines Corporation. Active wait. 4,631,674, Cl. 364-300.000.
Blank, Werner J.: *See*—
Parekh, Girish G.; and Blank, Werner J., 4,631,320, Cl. 525-452.000.
Blee, Timothy J.; and Deane, Norman P., to AE PLC. Vehicle gear shift indicator. 4,631,515, Cl. 340-62.000.
Blehm, Lynne; Makek, James R.; and White, W. Curtis, to Dow Corning Corporation. Aqueous emulsions using cationic silanes. 4,631,273, Cl. 514-29.000.
Blenkush, Brian J., to Colder Products Company. Multiple tube connector. 4,630,847, Cl. 285-29.000.
Blohm & Voss AG: *See*—
Franz, Hans-Joachim; Schmidt, Willy; and Sadler, Karl O., 4,630,561, Cl. 114-1.000.
Blom, C. James, to Roxor Corporation. Elimination of internal reflections and diffractions from junctures in, and at the periphery of, a segmented mirror. 4,630,905, Cl. 350-613.000.
Blue Giant Equipment of Canada Ltd.: *See*—
Davey, Jack E., 4,630,989, Cl. 414-401.000.
Board of Trustees operating Michigan State University: *See*—
Asmussen, Jes; and Reinhard, Donnie K., 4,630,566, Cl. 118-50.100.
Bober, Vincent J.: *See*—
Sylvester, Robert D., Jr.; Horn, Paul C.; and Bober, Vincent J., 4,631,511, Cl. 336-180.000.
BOC Group, Inc., The: *See*—
Miles, James J.; and Smith, John M., 4,630,486, Cl. 73-861.560.
Bochumer Eisenhuette Heintzmann GmbH & Co. KG: *See*—
Heintzmann, Peter; Koppers, Manfred; Bohnes, Karlheinz; and Domanski, Lothar, 4,630,973, Cl. 405-288.000.
Boeckx, Gustaaf M.; Raeymaekers, Alfons H. M.; and Sipido, Victor, to Janssen Pharmaceutica N.V. Anti-protozoal α-aryl-4-(4,5-dihydro-3,5-dioxo-1,2,4-triazin-2(3H)-yl)-benzeneacetonitrile derivatives, pharmaceutical compositions, and method of use therefor. 4,631,278, Cl. 514-242.000.
Boehm, Bernard; and Lacroix, Marc. Method of and apparatus for testing a metal body by means of eddy currents. 4,631,688, Cl. 364-507.000.
Boeing Company, The: *See*—
Chamberlain, Theron R., 4,630,441, Cl. 60-413.000.
Fenner, James A., 4,630,982, Cl. 410-102.000.
Knowlton, Dale E., 4,630,463, Cl. 72-479.000.
Rosenberg, Jerome C., 4,630,789, Cl. 244-135.00R.
Boeke, Burkhard; and Kalka, Josef, to Huels Aktiengesellschaft. Process for the production of paste-forming polymers of vinyl. 4,631,324, Cl. 526-212.000.
Boella, Marcello; and Carena, Ugo, to Ing C. Olivetti & C., S.p.A. Device for controlling the rotary movement of a platen. 4,630,949, Cl. 400-568.000.
Bofors Nobel, Inc.: *See*—
Hills, Blair H.; and Crispino, Vincent J., 4,631,156, Cl. 264-37.000.

Bohan, John E., Jr., to Honeywell Inc. Temperature controller with temperature limiting sensor. 4,631,626, Cl. 361-104.000.

Bohnes, Karlheinz: *See—*
Heintzmann, Peter; Koppers, Manfred; Bohnes, Karlheinz; and Domanski, Lothar, 4,630,973, Cl. 405-288.000.

Bomford, James A. Clamping yoke for concrete forms. 4,630,797, Cl. 249-20.000.

Bonanno, Carmine. Guitar controller for a music synthesizer. 4,630,520, Cl. 84-1.160.

Boni, Renato, to Massey-Ferguson Services N.V. Vehicle drive arrangement. 4,630,720, Cl. 192-48.800.

Bonnet, Ludwig, to Richard Wolf GmbH. Uretero-renoscope. 4,630,598, Cl. 128-7.000.

Bonucci, Peter A., to UF Genetics, Inc. Production of hybrid "improved supersweet" sweet corn. 4,630,393, Cl. 47-58.000.

Boomgaard, Dirk J.: *See—*
Neuner, James A.; Boomgaard, Dirk J.; Wilbur, Susan A.; and Geis, Charles G., 4,631,537, Cl. 340-870.170.

Borg Instruments GmbH: *See—*
Cremers, Rolf A., 4,630,894, Cl. 350-338.000.

Borg-Warner Corporation: *See—*
Smirl, Richard L., 4,630,504, Cl. 74-689.000.

Born, Joseph H.: *See—*
Hollis, Ernest E.; and Born, Joseph H., 4,631,420, Cl. 307-272.00R.

Borras, Jaime A.; and Suarez, Jose I., to Motorola, Inc. Battery saving system for a frequency synthesizer. 4,631,496, Cl. 331-1.00A.

Boschert Incorporated: *See—*
Small, Kenneth T., 4,631,653, Cl. 363-17.000.

Bosne, Georges J. P. E., to Hamon-Industries. Thermoformed sheet for a plate-type gas-gas heat exchanger and the exchanger including said sheet. 4,631,213, Cl. 428-53.000.

Bosshard, Ernst, to Sulzer Brothers Limited. Rack for storing nuclear fuel elements. 4,630,738, Cl. 211-60.100.

Boteler, William C., to Harvey Hubbell Incorporated. Cover assembly for electrical outlet box. 4,631,354, Cl. 174-66.000.

Bourland, Tommy E. Two bladed wallpaper trimmer. 4,630,369, Cl. 30-294.000.

Boyle, William B.; Candelaria, Rodolfo, Jr.; and Hecker, Edward P., to International Business Machines Corporation. Apparatus and method for assembling parts. 4,630,344, Cl. 29-149.50R.

Boyle, William G.; and Fisher, Ernest P., Jr., to Otis Engineering Corporation. Molded ring seal with end support rings. 4,630,833, Cl. 277-188.00A.

BPB Industries Public Limited Company: *See—*
Pilgrim, Thomas A., 4,630,419, Cl. 52-309.130.

Braa, Lloyd W.: *See—*
Dean, George J., Jr.; Klaeser, Robert S.; and Braa, Lloyd W., 4,630,397, Cl. 49-97.000.

Brackelmanns, Norbert W.: *See—*
Neilson, John M. S.; Wheatley, Carl F., Jr.; and Brackelmanns, Norbert W., 4,631,564, Cl. 357-23.400.

Bradley, David J.; and Ott, William B., to International Business Machines Corporation. Interrupt level sharing. 4,631,670, Cl. 364-200.000.

Bradley, William P., to Bedford Engineering Co. Envelope and enclosure sheet. 4,630,768, Cl. 229-92.700.

Braga, Thomas G.: *See—*
Johns, Marshall E.; Strassner, Keith D.; and Braga, Thomas G., 4,631,138, Cl. 252-8.555.

Braksmayer, Diza P.; Lee, Fui-Tseng H.; and Scholer, Fred R., to FMC Corporation. Flame retardant allylic esters of tetrabromophthalic acid and flame retardant polymers containing same. 4,631,148, Cl. 252-609.000.

Brancher, Rodney E.: *See—*
White, Robert M.; and Brancher, Rodney E., 4,630,852, Cl. 292-87.000.

Brandes, Wilhelm: *See—*
Kraatz, Udo; Buchel, Karl H.; Hanssler, Gerd; Brandes, Wilhelm; and Reinecke, Paul, 4,631,288, Cl. 514-340.000.

Branson International Plasma Corporation: *See—*
Carroll, John C.; and Shepherd, Robert A., Jr., 4,631,105, Cl. 156-345.000.

Brantingham, George L.: *See—*
Breedlove, Paul S.; Moore, James H.; Brantingham, George L.; and Wiggins, Richard H., Jr., 4,631,748, Cl. 381-51.000.

Braun, Hilarion; Lush, Linda; and Lehman, Scott, to Eastman Kodak Company. Method and apparatus for adjusting stimulation amplitude in continuous ink jet printer. 4,631,549, Cl. 346-1.100.

Braun, Robin M., to Plessey South Africa Limited. Injection locked RF oscillator with control hoop. 4,631,497, Cl. 331-4.000.

Brausfeld, Walter; and Meyer, Ernst-August, to WABCO Westinghouse Steuerungstechnik GmbH & Co. Sealing arrangement for a slide valve. 4,630,800, Cl. 251-324.000.

Bray, Donald J.: *See—*
Novak, John W., Jr.; Raines, Dennis R.; and Bray, Donald J., 4,630,665, Cl. 164-97.000.

Bray, James C.: *See—*
Ritter, Thomas A.; Bray, James C.; and Kaganov, Alan L., 4,630,617, Cl. 128-784.000.

Breedlove, Paul S.; Moore, James H.; Brantingham, George L.; and Wiggins, Richard H., Jr., to Texas Instruments Incorporated. Electronic handheld translator having miniature electronic speech synthesis chip. 4,631,748, Cl. 381-51.000.

Breen, Thomas J., to Rand McNally & Co. Self-locking baggage tag. 4,630,384, Cl. 40-21.00R.

Brendemuehl, Roger C.: *See—*
Ng, David T.; and Brendemuehl, Roger C., 4,631,682, Cl. 364-471.000.

Bricot, Claude: *See—*
Romeas, Rene ; Bricot, Claude; and Gerard, Jean-Louis, 4,631,713, Cl. 369-54.000.

Bridgestone Corporation: *See—*
Dan, Takuya; and Orikawa, Michihiro, 4,630,806, Cl. 267-140.100.
Ushijima, Takao; and Yamazaki, Harumichi, 4,630,808, Cl. 267-140.100.

Briggs & Stratton Corp.: *See—*
Santi, John D., 4,630,498, Cl. 74-445.000.

Brilman, Michel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Addressable photodetector array. 4,631,417, Cl. 250-578.000.

Brink, Heinz-Deiter: *See—*
Thomann, Roland; Witschi, Heinz; Brink, Heinz-Deiter; and Amann, Markus, 4,630,962, Cl. 404-2.000.

Bristol-Myers Company: *See—*
Koshiyama, Hideo; Sakai, Fumihide; and Ohkuma, Hiroaki, 4,631,256, Cl. 435-68.000.

British Nuclear Fuels plc: *See—*
Hepworth, Ian C., 4,630,628, Cl. 137-12.000.

Brodeur, Lester R., to Sanders Associates, Inc. Method and apparatus for reducing the effects of impulse noise in Loran-C receivers. 4,631,543, Cl. 342-389.000.

Broedner, Walter F., to Video-7 Incorporated. RGB interface. 4,631,692, Cl. 364-518.000.

Brombal, David S.; Bunner, Charles B. D.; Gulis, Nickolas S.; and Luszczek, John P., to Northern Telecom Limited. Electronic apparatus with electro-magnetic interference screening. 4,631,641, Cl. 361-424.000.

Brooke, Raymond; and Palombo, Gaston, to Computer Memories, Inc. Capacitive encoder having multiple precision outputs. 4,631,524, Cl. 340-347.00P.

Brooke, Robert L.; McConnell, Peter J.; Testa, Anthony M.; and Maksymonko, George B., to United States of America, Army. Remote sensing of vehicle tire pressure. 4,630,470, Cl. 73-146.200.

Brooks Instrument, Zweigniederlassung Elmshorn der Emerson Electric GmbH: *See—*
Furst, Leander; Ballast, Johan T. G.; and Jahnel, Kurt, 4,630,637, Cl. 137-340.000.

Brose Fahrzeugteile GmbH: *See—*
Schust, Gerhard, 4,630,398, Cl. 49-352.000.

Brown, Ann H. Method of treating fingernails and cuticles. 4,631,186, Cl. 424-61.000.

Brown, Donald W., Jr.; and Kohler, Mark L., to T.J. Gundlach Machine Company. Apparatus and method for removing crushing rolls from a crushing apparatus. 4,630,781, Cl. 241-159.000.

Brown, Edward M.: *See—*
Chamberlin, Edward B.; Brown, Edward M.; and Towns, Edward J., 4,631,003, Cl. 417-151.000.

Brown, Larry L.; and Lisle, Jerry H., to Brown, Larry L. Sweat band apparatus. 4,630,317, Cl. 2-12.000.

Brown, Mark E.: *See—*
Piatt, Michael J.; and Brown, Mark E., 4,631,550, Cl. 346-1.100.

Brown, Paul R., to RCA Corporation. Grooved waveguide shorting block and method of assembly. 4,631,503, Cl. 333-24.100.

Brown, William C.: *See—*
Bilstad, Arnold C.; and Brown, William C., 4,630,448, Cl. 62-60.000.

Brown & Williamson Tobacco Corp.: *See—*
Korte, Kevin R.; and Wu, Dan T., 4,630,619, Cl. 131-296.000.

Brownrigg, James K.: *See—*
McCollum, Patrick E.; Brownrigg, James K.; and Linder, Carl O., 4,631,472, Cl. 323-325.000.

Brugliera, Vito; Green, George R. J.; and Long, Michael E., to Zenith Electronics Corporation. Time programmable control system for a converter/VCR system. 4,631,601, Cl. 358-335.000.

Brun, Norbert, to Cibie Projecteurs. Adaptor for coupling a light guide to a light source, in particular for providing an integrated side light in a motor vehicle headlamp assembly. 4,631,642, Cl. 362-32.000.

Bruning, Donald D.: *See—*
Mumallah, Naim A.; Bruning, Donald D.; and Needham, Riley B., 4,630,678, Cl. 166-281.000.

Brunon, Jean-Marc, to Commissariat a l'Energie Atomique. Method for the production of a nuclear reactor assembly and assembly obtained by this method. 4,631,167, Cl. 376-446.000.

Brunswick Corporation: *See—*
McCormick, Daniel F., 4,630,719, Cl. 192-21.000.

Buchegger, Rudolf; and Langeder, Rudolf, to Voest-Alpine Aktiengesellschaft. Coiler. 4,630,785, Cl. 242-72.100.

Buchel, Karl H.: *See—*
Kraatz, Udo; Buchel, Karl H.; Hanssler, Gerd; Brandes, Wilhelm; and Reinecke, Paul, 4,631,288, Cl. 514-340.000.

Buckley, James F., to Gym Bee Enterprises, Inc. Recreation apparatus. 4,630,817, Cl. 272-73.000.

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Thormer, Joachim; Leibbrandt, Friedrich; Szentivanyi, Zsolt; and Buding, Hartmuth, 4,631,309, Cl. 524-426.000.

Bunner, Charles B. D.: *See—*
Brombal, David S.; Bunner, Charles B. D.; Gulis, Nickolas S.; and Luszczek, John P., 4,631,641, Cl. 361-424.000.

Bunse, Peter: *See—*
Hellerhoff, Josef; Bunse, Peter; and te Beest, Hans, 4,630,349, Cl. 29-434.000.

Burandt, Wesley A., to Sundstrand Corporation. Variable displacement hydraulic pressure intensifier. 4,631,000, Cl. 417-225.000.

Burback, Ronald E.: *See—*
Windows, David W.; and Burback, Ronald E., 4,630,627, Cl. 135-112.000.

Burk, Ronnie F.; Delfs, Larry M.; Gilmore, Michael R.; and Thompson, Warren L., to Deere & Company. Force control system including bypass flow path for implement with relatively movable frame parts. 4,630,526, Cl. 91-452.000.

Burkeen, Ralph D.; and Labender, Ron. Fishing gear permitting switching to heavy line for landing. 4,630,390, Cl. 43-43.110.

Burkett, Cullen L. Apparatus and method for securely fastening various pierced earring posts. 4,630,453, Cl. 63-12.000.

Burkhardt, Horst; Ernst, Alfons; Dangschat, Holmer; and Wogatzke, Horst, to Johannes Heidenhain GmbH. Position measuring system. 4,631,404, Cl. 250-237.00G.

Burkhardt, Norman S.; Richard, Maureen M.; Buxton, Forrest T.; and Nowak, Ronald J. High speed, high resolution image processing system. 4,631,598, Cl. 358-280.000.

Burlington Industries, Inc.: *See—*
Hussamy, Samir, 4,631,067, Cl. 8-464.000.

Burndy Corporation: *See—*
Bauer, Alajos Z.; and Verespej, Michael A., 4,630,362, Cl. 29-751.000.

Burron Medical, Inc.: *See—*
Raines, Kenneth C., 4,631,058, Cl. 604-263.000.

Burroughs Corporation: *See—*
Harris, Craig W.; Jevons, Lyle O., Jr.; and Loskorn, Richard A., 4,631,666, Cl. 364-200.000.
Romania, Samuel R.; and Steen, Grant F., 4,631,637, Cl. 361-413.000.
Sudol, George A.; Comfort, Edward H.; and Solomon, Stephen R., 4,631,608, Cl. 360-99.000.

Burt, Edward A.: *See—*
Goins, Dixie E.; Holmes, Silas W.; and Burt, Edward A., 4,631,349, Cl. 568-789.000.

Burton, James R.; and Kushner, David J., to Texaco Inc. Corrosion inhibiting metal working fluid. 4,631,139, Cl. 252-49.300.

Burton, Trevor: *See—*
Taylor, Frank; and Burton, Trevor, 4,630,358, Cl. 29-594.000.

Buss, Waldeen C.; and Hughes, Thomas R., to Chevron Research Company. Method of dehydrocyclizing alkanes. 4,631,123, Cl. 208-138.000.

Butler, John D., to Mechtrix Corporation. Method of using an elliptical form to generate a perfect radius in an insulated electrical conductor stripping blade. 4,630,406, Cl. 51-285.000.

Butlin, Duncan M., to Hughes Tool Company. Submersible pump pressure detection circuit. 4,631,535, Cl. 340-856.000.

Buttner, Erwin: *See—*
Maul, Sonja; Buttner, Erwin; Meichelbock, Heiner; Merz, Albert; and Vogg, Hubert, 4,630,464, Cl. 73-28.000.

Buxbaum, Gunter: *See—*
Naumann, Rolf; Leitner, Lutz; Rademachers, Jakob; and Buxbaum, Gunter, 4,631,090, Cl. 106-304.000.

Buxton, Forrest T.: *See—*
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C. A. Weidmuller GmbH & Co.: *See—*
Wiener, Hans; and Undin, Hans, 4,630,462, Cl. 72-410.000.

Cabot, Richard C., to Audio Precision, Inc., a part interest. Method and circuit for compensation of a multiplying digital-to-analog converter. 4,631,522, Cl. 340-347.0CC.

Caines, R. Scott, to American Hoechst Corporation. Process for manufacture of surface-modified oriented polymeric film. 4,631,155, Cl. 264-22.000.

Calderazzo, Mark A.: *See—*
Frankenberg, Robert E.; and Calderazzo, Mark A., 4,631,020, Cl. 425-527.000.

Caldwell, Gary L.: *See—*
Valteris, Ramunas L.; and Caldwell, Gary L., 4,631,018, Cl. 425-445.000.

Calhoun, Donald F., to Hughes Aircraft Company. Means and method of reducing the number of masks utilized in fabricating complex multi-level integrated circuits. 4,631,569, Cl. 357-45.000.

California Institute of Technology: *See—*
Tanner, John E.; and Mead, Carver A., 4,631,400, Cl. 250-221.000.

Calvert, Wilson D., Sr.: *See—*
Kessler, Peter H.; Calvert, Wilson D., Sr.; and Pintchovski, Faivel S., 4,630,669, Cl. 165-1.000.

Calviello, Joseph A., to Eaton Corporation. MOMS tunnel emission transistor. 4,631,560, Cl. 357-6.000.

Camden, Thomas M., Jr., to Westinghouse Electric Corp. High utilization fuel assembly. 4,631,166, Cl. 376-435.000.

Camillo Corvi S.p.A.: *See—*
Mora, Camillo C., 4,631,293, Cl. 514-530.000.

Campbell, Joe C.; and Dentai, Andrew G., to AT&T Bell Laboratories. Long wavelength avalanche photodetector. 4,631,566, Cl. 357-30.000.

Campell, Jeptha E., to Spiral Systems, Inc. Apparatus for precisely dispensing free flowing solids. 4,630,755, Cl. 222-56.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources: *See—*
Poirier, Marc-Andre , 4,631,088, Cl. 106-273.00R.

Canadian Patents and Deveopment Limited—Societe Canadienne des Brevets et d'Exploitation Limitee: *See—*
Korba, Larry, 4,631,702, Cl. 364-900.000.

Candelaria, Rodolfo, Jr.: *See—*
Boyle, William B.; Candelaria, Rodolfo, Jr.; and Hecker, Edward P., 4,630,344, Cl. 29-149.50R.

Cangiano, Frank: *See—*
Bergin, John A.; and Cangiano, Frank, 4,631,651, Cl. 362-267.000.

Canon Kabushiki Kaisha: *See—*
Ikeda, Masami; Shibata, Makoto; Matsuda, Hiroto; and Takahashi, Hiroto, 4,631,555, Cl. 346-140.00R.
Imai, Shunzo; and Ishiyama, Ichiro, 4,630,922, Cl. 355-55.000.
Kaneko, Shuzo, 4,631,559, Cl. 346-160.000.
Kato, Masatake; and Ikemori, Keiji, 4,630,899, Cl. 350-427.000.
Kinoshita, Takao; and Sakai, Shinji, 4,631,593, Cl. 358-213.000.
Mochizuki, Noritaka; and Minami, Setsuo, 4,630,902, Cl. 350-570.000.
Sasaki, Takashi; Kawamura, Hideaki; and Sakurada, Nobuaki, 4,631,578, Cl. 358-80.000.
Terasawa, Koji, 4,631,554, Cl. 346-140.00R.
Toyomura, Shigeru, 4,631,418, Cl. 307-200.00A.
Watanabe, Yoshitaka; and Endo, Takashi, 4,631,556, Cl. 346-140.00R.
Yaguchi, Tatsuya, 4,631,596, Cl. 358-256.000.

Capella, Joseph A.; and Fowler, David E., to Quadrex HPS, Inc. Tool decontamination apparatus. 4,630,625, Cl. 134-104.000.

Card, Joseph L.: *See—*
Card, Roy T.; and Card, Joseph L., 4,630,558, Cl. 112-266.200.

Card, Roy T.; and Card, Joseph L. Tufting machine and method of tufting for producing multiple rows of tufts with single lengths of yarn. 4,630,558, Cl. 112-266.200.

Carena, Ugo: *See—*
Boella, Marcello; and Carena, Ugo, 4,630,949, Cl. 400-568.000.

Carl Hurth Maschinen und Zahnradfabrik GmbH & Co.: *See—*
Erhardt, Manfred; Loos, Herbert; Lohrer, Josef; Schapp, Udo; Schaeferling, Karl-Josef; and Freundl, Walter, 4,630,402, Cl. 51-105.0GG.
Erhardt, Manfred; and Loos, Herbert, 4,630,404, Cl. 51-105.0GG.

Carl-Zeiss-Stiftung: *See—*
Altenheiner, Erwin; Schlicht, Gunther; and Hornschu, Joachim, 4,630,901, Cl. 350-552.000.
Bammert, Hubert; Lahres, Hans; and Mosch, Egon, 4,630,906, Cl. 351-159.000.

Carlsson, Kjell S., to Sarastro AB. Method and apparatus for microphotometering microscope specimens. 4,631,581, Cl. 358-93.000.

Carr, Neil: *See—*
Andrews, Beatrice M.; Carr, Neil; Gray, George W.; and Hogg, Christine, 4,630,897, Cl. 350-350.00R.

Carre, Jean-Jacques; Thioux, Alain; and Mery, Jean-Claude, to Societe Anonyme D.B.A. Disc brake with sliding caliper. 4,630,713, Cl. 188-73.440.

Carreno, Victor A., to United States of America, National Aeronautics and Space Administration. Single frequency multitransmitter telemetry system. 4,631,538, Cl. 340-870.180.

Carrier Corporation: *See—*
Wellman, Donald C.; and Clark, William E., 4,630,670, Cl. 165-16.000.

Carroll, John C.; and Shepherd, Robert A., Jr., to Branson International Plasma Corporation. Plasma etching apparatus. 4,631,105, Cl. 156-345.000.

Carron & Company: *See—*
Malicki, Raymond W., 4,630,490, Cl. 73-862.650.

Casio Computer Co., Ltd.: *See—*
Usami, Ryuuzi, 4,630,518, Cl. 84-1.030.

Caspell, George J., to Tektronix, Inc. Digital-to-analog converter biasing control circuit. 4,631,518, Cl. 340-347.0DA.

Casper, Robert K.; and Runner, James F., to Koch Carbon Inc. Calcining process using fluid coke fuel. 4,631,025, Cl. 432-15.000.

Cassidy, Frederick, to Beecham Group Plc. Antihypertensive chromans and chromenes. 4,631,282, Cl. 514-254.000.

Catalysts & Chemicals Industries Co., Ltd.: *See—*
Sato, Goro; Ogata, Masamitsu; and Ida, Takanori, 4,631,261, Cl. 502-65.000.

Caterpillar Inc.: *See—*
Huck, Francis B., Jr.; and Janzen, David C., 4,630,685, Cl. 172-7.000.

Cato Research Corporation: *See—*
Kruesi, Paul R., 4,631,176, Cl. 423-100.000.

Cavada, David R.; and Golick, Leonard R., to Westinghouse Electric Corp. Reactor vessel stud cleaning machine. 4,630,410, Cl. 51-410.000.

Cavallaro, Robert E.: *See—*
Whiteside, George D.; and Cavallaro, Robert E., 4,630,915, Cl. 354-275.000.

Cawkell, Anthony E., to Institute for Scientific Information, Inc. Selective optoelectronic copier. 4,631,599, Cl. 358-285.000.

CDP, Ltd.: *See—*
Ecer, Gunes M., 4,630,692, Cl. 175-330.000.

Central Glass Company Limited: *See—*
Koishi, Toshio; and Yasumura, Takashi, 4,631,326, Cl. 526-249.000.

Central Plastics Company: *See—*
Ramsey, Russel G., 4,631,107, Cl. 156-359.000.

Central Sprinkler Corporation: *See—*
Pieczykolan, George S., 4,630,682, Cl. 169-38.000.

Cetus Corporation: *See—*
Gelfand, David H., 4,631,257, Cl. 435-68.000.

Chadwell, Thomas J.: *See—*
Schneider, Michael H.; and Chadwell, Thomas J., 4,630,377, Cl. 33-181.0AT.
Chainer, Timothy J.; Scranton, Robert A.; and Thompson, David A., to International Business Machines Corp. Tubular squeeze bearing apparatus with rotational restraint. 4,630,941, Cl. 384-1.000.
Chakraborty, Utpal R.; and Youssefyeh, Raymond D., to USV Pharmaceutical Corp. Aryl and heteroaryl ethers as agents for the treatment of hypersensitive ailments. 4,631,287, Cl. 514-307.000.
Challenge Tool & Manufacturing, Inc.: *See—*
Redmon, Larry, 4,631,044, Cl. 474-114.000.
Chamberlain, Theron R., to Boeing Company, The. Electrohydraulic actuator for aircraft control surfaces. 4,630,441, Cl. 60-413.000.
Chamberlin, Edward B.; Brown, Edward M.; and Towns, Edward J., to Spray-All, Inc. Fluid medium compressor and user apparatus. 4,631,003, Cl. 417-151.000.
Chandra, Grish; and Kwai Lo, Peter Y., to Dow Corning Corporation. Platinum (O) alkyne complexes and a method for their preparation. 4,631,310, Cl. 524-862.000.
Chang, Richard; and Nakano, Walter, to Mattel, Inc. Miniature flywheel car for side-wheelie stunts. 4,631,041, Cl. 446-233.000.
Chapman, Malcolm R., to Grumman Aerospace Corporation. Transportable solar power station. 4,630,791, Cl. 244-173.000.
Chard, Brian C., to Imperial Group PLC. Apparatus and method for forming a rod of smokeable material. 4,630,618, Cl. 131-84.300.
Charles Stark Draper Laboratory, Inc., The: *See—*
Drescher, Robert D.; Eisenhaure, David B.; Hockney, Richard L.; Johnson, Bruce G.; St. George, Emery, Jr.; and Whipple, David C., 4,631,456, Cl. 318-140.000.
Charrier, Bertrand: *See—*
Cousteau, Jacques Y.; Malavard, Lucien; and Charrier, Bertrand, 4,630,997, Cl. 416-90.00A.
Chart Industries Limited: *See—*
Wickmann, John T.; and Olak, Richard, 4,630,379, Cl. 33-288.000.
Cheever, Richard N., to Tetra Pak Developpement SA. Readily attachable and detachable electron-beam permeable window assembly. 4,631,444, Cl. 313-420.000.
Chemische Fabrik Stockhausen GmbH: *See—*
Stockhausen, Dolf; Nowak, Rudolf; Chmelir, Miroslav; Kaussen, Manfred; and Dahmen, Kurt, 4,631,063, Cl. 8-94.210.
Chevron Research Company: *See—*
Buss, Waldeen C.; and Hughes, Thomas R., 4,631,123, Cl. 208-138.000.
Plavac, Frank, 4,631,070, Cl. 44-63.000.
Chew, Ju-Nam, to Mobil Oil Corporation. Separation of mixtures of bituminous coal and lower rank coal by selective chemical comminution. 4,630,778, Cl. 241-1.000.
Chiang, Ming-Yao; and Chiang, Pei-Leh. Gravitationally-operating collapsible basket. 4,630,747, Cl. 220-7.000.
Chiang, Pei-Leh: *See—*
Chiang, Ming-Yao; and Chiang, Pei-Leh, 4,630,747, Cl. 220-7.000.
Chibnik, Sheldon: *See—*
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Chilinski, Herbert; Getzlaff, Klaus J.; Hajdu, Johann; and Raeth, Franz J., to International Business Machines Corporation. Macroinstruction execution in a microprogram-controlled processor. 4,631,663, Cl. 364-200.000.
Chilton, James E. Hydrant valve tool. 4,630,347, Cl. 29-213.00R.
Chin, Albert K., to Fogarty, Thomas J. Dilatation catheter method and apparatus. 4,630,609, Cl. 128-344.000.
Chipman-Union, Inc.: *See—*
Lingenfelter, Ralph E., 4,630,455, Cl. 66-172.00R.
Chloride Systems, a division of Chloride Power Electronics, Incorporated: *See—*
McCue, Robert J.; and Minter, Ronald H., 4,631,649, Cl. 362-183.000.
Chmelir, Miroslav: *See—*
Stockhausen, Dolf; Nowak, Rudolf; Chmelir, Miroslav; Kaussen, Manfred; and Dahmen, Kurt, 4,631,063, Cl. 8-94.210.
Chouinard, Michael P.; and Bancroft, Lewis C., to Du Pont de Nemours, E. I., and Company. Process for thermoremanent duplication of magnetic tapes using transverse laser beams spanning the tape width. 4,631,602, Cl. 360-16.000.
Christensen, Clad P. High frequency RF discharge laser. 4,631,732, Cl. 372-87.000.
Christhilf, Harold H.; Morrison, Paul E.; and Niemczura, Paul W., to Witco Corporation. Pipe varnish compositions and use thereof. 4,631,083, Cl. 106-14.230.
Christie, Rosemary; Hwang, Bao-Tai; Ku, San-Mei; and Sickler, Janet M., to International Business Machines Corporation. Method of forming recessed oxide isolation with reduced steepness of the birds' neck. 4,630,356, Cl. 29-576.00W.
Christine, William C., to Baxter Travenol Laboratories, Inc. Apparatus and method for sealing a web of film in a form, fill, and seal packaging system. 4,630,429, Cl. 53-479.000.
Chrysler Motors Corporation: *See—*
Betterton, Joseph T.; and Glover, Alfred H., 4,630,480, Cl. 73-431.000.
Durand, Remie P., 4,630,880, Cl. 339-176.00L.
Kissel, William R., 4,631,628, Cl. 361-154.000.
Kronberger, Leonard J., 4,631,370, Cl. 200-19.00R.
Kronberger, Leonard J., 4,631,371, Cl. 200-19.0DC.
Kronberger, Leonard J., 4,631,372, Cl. 200-19.00R.
Zimmerman, Karen A.; Weston, Randall L.; and Thomas, Richard D., 4,630,472, Cl. 73-161.000.
Chu, Mosi; and Kuo, Meng S., to Primages, Inc. Paper bail for a printer and associated methods of operation thereof. 4,630,950, Cl. 400-639.100.
Chvapil, Milos: *See—*
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Ciba-Geigy AG: *See—*
Howell, Frederick H., 4,631,252, Cl. 430-551.000.
Ciba-Geigy Corporation: *See—*
Seitz, Karl; Scheibli, Peter; and Seiler, Herbert, 4,631,065, Cl. 8-549.000.
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Cincinnati Microwave, Inc.: *See—*
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Cincinnati Milacron Inc.: *See—*
Rudisill, Carl D., 4,630,811, Cl. 269-118.000.
Cinquin, Jean P.; Gazzolo, Christian; and Pisciotta, Michel, to Ferraz. Electro-mechanical devices incorporating fuse cartridges. 4,631,508, Cl. 335-142.000.
Cinzori, Robert J.; and Kern, Mark T., to Santa Barbara Research Center. Fire sensing and suppression method and system responsive to optical radiation and mechanical wave energy. 4,630,684, Cl. 169-46.000.
Citizen Watch Co., Ltd.: *See—*
Saito, Asao, 4,630,751, Cl. 220-334.000.
Claar, Klaus: *See—*
Keller, Manfred; Kolle, Rudi; Schreiber, Winfried; and Claar, Klaus, 4,630,330, Cl. 16-2.000.
Clarion Co., Ltd.: *See—*
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Clark, Harold R.; and Nicol, David A., to AT&T Technologies, Inc. Method for stretching a glass rod. 4,631,079, Cl. 65-109.000.
Clark Michigan Company: *See—*
Siewert, Robert L.; and Varnelis, Edmund K., 4,630,698, Cl. 180-69.240.
Clark, William E.: *See—*
Wellman, Donald C.; and Clark, William E., 4,630,670, Cl. 165-16.000.
Clarke, Kenneth J.; and Lamb, Gordon, to Conterm International Terminals, Inc. Expendable refrigeration control. 4,630,450, Cl. 62-222.000.
Claudius Peters AG: *See—*
Krauss, Werner, 4,630,531, Cl. 98-52.000.
Claudon, Brian J. Fish processor. 4,630,335, Cl. 17-58.000.
Cleanseal Systems, Inc.: *See—*
Nguyen, Hung T.; Dang, Vu Q.; Duval, Henry H., Jr.; and Kennedy, Donald J., 4,630,965, Cl. 404-107.000.
Clesse-Mandet: *See—*
Lacour, Gilbert, 4,630,641, Cl. 137-505.380.
Clewell, Don B.; and Gawron-Burke, Mary C., to University of Michigan, Board of Regents of The. Transposon in cloning DNA. 4,631,259, Cl. 435-172.300.
Clifton, Richard B., to Minnesota Mining and Manufacturing Company. Coated abrasive back-up pad with metal reinforcing plate. 4,631,220, Cl. 428-133.000.
Clinker, Gerald. Auxiliary vehicle warning system. 4,631,516, Cl. 340-76.000.
Coar, Lawrence F.: *See—*
Bender, Roland A.; Howarth, Lawrence R.; and Coar, Lawrence F., 4,631,709, Cl. 367-4.000.
Codex Corporation: *See—*
Qureshi, Shahid U. H., 4,631,735, Cl. 375-34.000.
Coladonato, Michael A.: *See—*
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Colder Products Company: *See—*
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Coleco Industries, Inc.: *See—*
Amici, Francis R.; Farrington, Richard I.; and Piazza, Pietro, 4,630,756, Cl. 222-78.000.
Coleman Company, Inc., The: *See—*
Crane, James W.; and Skanaker, Ragnar, 4,630,387, Cl. 42-73.000.
Collier, William R. Modular combination floor support and electrical isolation system for use in building structures. 4,630,417, Cl. 52-263.000.
Collins, Galen, to Benson, Inc. Time base generator for color image processor. 4,631,740, Cl. 377-76.000.
Collins, Jiles W. Router attachment. 4,630,656, Cl. 144-134.00D.
Colliopoulos, John A.; Young, James G.; and Tsau, Josef H. Sweetening composition. 4,631,195, Cl. 426-548.000.
Collister, Kenneth D. One piece child safety handle. 4,630,331, Cl. 16-111.00R.
Colson, Wendell B., to Thermocell, Ltd. Apparatus for fabricating honeycomb insulating material. 4,631,108, Cl. 156-461.000.
Columbia University in the City of New York, The Trustees of: *See—*
Kim, Syngcuk, 4,631,185, Cl. 424-49.000.
Combourieu, Michel; Bernet, Yvon; Laigle, Jean-Claude; and Simbille, Nadine, to Riom Laboratories C.E.R.M. "RL-C.E.R.M." S.A. Hexahydrodibenzodioxane compounds and pharmaceutical compositions. 4,631,277, Cl. 514-239.000.
Comfort, Edward H.: *See—*
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Brunon, Jean-Marc, 4,631,167, Cl. 376-446.000.

Cornu, Ayme , 4,631,384, Cl. 219-121.00P.
Jacquot, Bernard, 4,631,438, Cl. 313-359.100.
Commonwealth Scientific and Industrial Research Organization: *See*—
Jellinek, Thomas, 4,631,226, Cl. 428-270.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Brilman, Michel, 4,631,417, Cl. 250-578.000.
Computer Memories, Inc.: *See*—
Brooke, Raymond; and Palombo, Gaston, 4,631,524, Cl. 340-347.00P.
Condit, Paul A., Sr. Multi-purpose filter system. 4,631,127, Cl. 210-232.000.
Conmaco, Inc.: *See*—
Jackson, E. Don, 4,630,524, Cl. 91-219.000.
Connelly, Lynette M.; and Gatof, Norman, to Crystal Brands, Inc. Earring clutch mechanism and detachable load distribution member for use in combination therewith. 4,630,452, Cl. 63-12.000.
Connors, Robert H.; and Williams, James T., to Triangle Package Machinery Co. Combinatorial weigher employing double group split logic. 4,630,695, Cl. 177-1.000.
Conrad, John R.: *See*—
Eckstrom, William R.; and Conrad, John R., 4,630,530, Cl. 98-2.110.
Consortium fur elektrochemische Industrie GmbH: *See*—
Gebauer, Helmut; and Regiert, Marlies, 4,631,146, Cl. 252-522.00R.
Container Products Corp.: *See*—
Hughes, Joel, 4,630,750, Cl. 220-324.000.
Conterm International Terminals, Inc.: *See*—
Clarke, Kenneth J.; and Lamb, Gordon, 4,630,450, Cl. 62-222.000.
Continental Bondware, Inc.: *See*—
Fear, Robert E., 4,630,733, Cl. 206-459.000.
Continental Gummi-Werke Aktiengesellschaft: *See*—
Howind, Volker, 4,630,662, Cl. 152-397.000.
Convent Knabber-Geback GmbH & Co.: *See*—
Schaaf, Heinz; and Walter, Horst, 4,630,533, Cl. 99-353.000.
Conway, Richard J.: *See*—
Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; Conway, Richard J.; and Tucker, Peter G., 4,631,081, Cl. 71-94.000.
Cooke, Theodore M.; and DeBonte, William J., to Exxon Printing Systems, Inc. Ink jet employing phase change ink and method of operation. 4,631,557, Cl. 346-140.00R.
Cookerly, Jack C.: *See*—
Hall, Robert J.; Hall, George R.; and Cookerly, Jack C., 4,630,517, Cl. 84-1.010.
Cooley, Denton A.: *See*—
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Cooperative Marketing Co., The: *See*—
Albery, Lewis L., 4,630,731, Cl. 206-425.000.
Coors Porcelain Company: *See*—
Langman, Richard A.; Giovanini, Donald R.; and Letzig, Michael P., 4,631,160, Cl. 264-62.000.
Coote, Cyril E.: *See*—
Hill, John; Turczanski, Henryk; and Coote, Cyril E., 4,630,359, Cl. 29-602.00R.
Coplan, Myron J.; and Bilewski, Fred, to Albany International Corporation. Permselective hollow fiber bundle. 4,631,128, Cl. 210-321.500.
Cordell, Barbara: *See*—
Dale, Beverly; and Cordell, Barbara, 4,631,191, Cl. 424-88.000.
Cordis Corporation: *See*—
Harris, Donald L., 4,631,051, Cl. 604-9.000.
Yomtov, Barry M., 4,630,615, Cl. 128-734.000.
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Corning Glass Works: *See*—
Lachman, Irwin M.; and Nordlie, Lawrence A., 4,631,267, Cl. 502-439.000.
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Cornu, Ayme , to Commissariat a l'Energie Atomique. Bitumen combustion process. 4,631,384, Cl. 219-121.00P.
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Rocha Cabral, Jose E.; and Correa Mellone, Oswaldo A., 4,630,953, Cl. 401-83.000.
Corthout, Marc E. A.; and Mielekamp, Pieter M., to U.S. Philips Corporation. Multiprocessor computer system for forming a color picture from object elements defined in a hierarchic data structure. 4,631,690, Cl. 364-518.000.
Corwon, Michael E.: *See*—
Sanders, Gary G.; and Corwon, Michael E., 4,631,539, Cl. 340-870.290.
Costello, Rocky C.: *See*—
Baker, Roy A.; Costello, Rocky C.; and Engel, Michael J., 4,631,068, Cl. 23-293.00S.
Cotta, Gilbert A.: *See*—
Steeves, Jay M.; and Cotta, Gilbert A., 4,630,766, Cl. 227-8.000.
Couch, John L.: *See*—
Rand, Roy E.; and Couch, John L., 4,631,741, Cl. 378-10.000.
Coulter Electronics, Inc.: *See*—
Proni, Oscar; and James, Bobby D., 4,631,483, Cl. 324-71.400.
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Levrai, Roland; Courbot, Pierre; and Picot, Pascal, 4,630,711, Cl. 184-6.120.
Courrege, Claude, to Rippes S.A. Burner for gas blow torch. 4,631,023, Cl. 431-329.000.
Courtney, Thomas F., Jr.; Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; and Wiener, Charles, to International Flavors & Fragrances Inc. Esters of alkylthioalkanoic acids. 4,631,194, Cl. 426-535.000.
Cousteau, Jacques Y.; Malavard, Lucien; and Charrier, Bertrand, to Fondation Cousteau. Apparatus for producing a force when in a moving fluid. 4,630,997, Cl. 416-90.00A.
Coviello, Frank; and Antico, Michael, to Lantel International Corp. Multi-line telephone system. 4,631,367, Cl. 379-157.000.
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Torossian, Kevork A.; Markovitz, Mark; and Cox, Frederick E., 4,631,230, Cl. 428-412.000.
Coyne, Joan H.; Dooling, David J.; Miller, Louis E.; and Nalbone, Robert D., to AT&T Information Systems Inc. Communication system having dynamically assigned station set buttons. 4,631,364, Cl. 379-164.000.
Crane, Dale E.; Jones, Robert E.; Watson, Mathew D.; and White, Alan D., to UNIPHASE Corporation. Cold cathode gas tubes. 4,631,727, Cl. 372-33.000.
Crane, James W.; and Skanaker, Ragnar, to Coleman Company, Inc., The. Adjustable pistol grip. 4,630,387, Cl. 42-73.000.
Credelle, Thomas L.; and Firester, Arthur H., to RCA Corporation. LCD pixel incorporating segmented back-to-back diode. 4,630,893, Cl. 350-334.000.
Cremers, Rolf A., to Borg Instruments GmbH. Multi-colored liquid crystal display with color transflector and color filter. 4,630,894, Cl. 350-338.000.
Creswick, Martin: *See*—
Wood, David H.; and Creswick, Martin, 4,631,708, Cl. 367-2.000.
Crispino, Vincent J.: *See*—
Hills, Blair H.; and Crispino, Vincent J., 4,631,156, Cl. 264-37.000.
Cross Company, The: *See*—
Moehr, Robert, 4,630,944, Cl. 384-39.000.
Crossley, Peter W.; Fellerman, Bernard F.; and Goodchild, Graham H., to THORN EMI Domestic Appliances Limited. Thermal limiter. 4,631,390, Cl. 219-449.000.
Croteau, Donald W., to Thermo Electron-Web Systems, Inc. Self-compensating support element and end closure therefor. 4,630,328, Cl. 15-257.00R.
Crystal Brands, Inc.: *See*—
Connelly, Lynette M.; and Gatof, Norman, 4,630,452, Cl. 63-12.000.
Cuisia, Dionisio G.; and Hwa, Chih M., to R. W. Grace & Co. Method for inhibiting scale. 4,631,131, Cl. 210-697.000.
Cushman, Larry A. Portable label maker. 4,630,538, Cl. 101-45.000.
Cutcher, Dennis R., to Baker CAC. Actuator with nonelastomeric seal. 4,630,636, Cl. 137-315.000.
Cutler, Gregory M., to Hewlett-Packard Company. CW Laser wavemeter/frequency locking technique. 4,631,498, Cl. 331-9.000.
Cutters Exchange, Inc.: *See*—
Fyfe, Leo W.; and Seaman, A. Matthew, 4,630,364, Cl. 29-779.000.
Cygnor, John E.; and Hallman, John, to Sundstrand Corporation. Lubrication scavenge system. 4,631,009, Cl. 418-15.000.
Czumak, Frank M.; and Sulesky, Donald J., to Polaroid Corporation. Photographic film frame ejector. 4,630,914, Cl. 354-212.000.
Da Vinci Laboratories, a division of FoodScience Corporation: *See*—
Kendall, Roger V.; and Graber, Charles D., 4,631,189, Cl. 424-85.000.
Dahmen, Kurt: *See*—
Stockhausen, Dolf; Nowak, Rudolf; Chmelir, Miroslav; Kaussen, Manfred; and Dahmen, Kurt, 4,631,063, Cl. 8-94.210.
Dai Showa Seiki Kabushiki Kaisha: *See*—
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Daido Tokushuko Kabushiki Kaisha: *See*—
Isobe, Susumu; Matsunaga, Kenkichi; Takagi, Yoshiaki; and Sato, Norikatsu, 4,631,169, Cl. 420-443.000.
Dailey Petroleum Services Corp.: *See*—
Beasley, Thomas R.; and Teng, Chuan C., 4,630,690, Cl. 175-57.000.
Daimler-Benz Aktiengesellschaft: *See*—
Keller, Manfred; Kolle, Rudi; Schreiber, Winfried; and Claar, Klaus, 4,630,330, Cl. 16-2.000.
Schmidt, Manfred; Trube, Hans; and Grimm, Hermann, 4,630,327, Cl. 15-250.210.
Werner, Hans; Knothe, Frank; Graf, Paul; Wallentowitz, Henning; Keller, Hans-Hermann; and Kist, Alfred, 4,630,803, Cl. 267-8.00R.
Dainippon Ink and Chemicals, Inc.: *See*—
Hosoda, Atsushi; Miura, Yoshikiyo; Mizuno, Takehisa; and Morita, Tsuyoshi, 4,631,307, Cl. 524-269.000.
Dale, Beverly; and Cordell, Barbara, to Biotechnology Research Partners, Ltd. Methods and compositions useful in preventing equine influenza. 4,631,191, Cl. 424-88.000.
Daly, Daniel F.: *See*—
Bergeron, Lawrence E.; Daly, Daniel F.; and Grosso, Elaine C., 4,631,746, Cl. 381-35.000.
D'Amato, Ralph J.; and Godfrey, Richard H., to RCA Corporation. Cathode-ray tube having cylindrical faceplate and shadow mask with minor axis curvatures. 4,631,439, Cl. 313-402.000.
Dan, Takuya; and Orikawa, Michihiro, to Bridgestone Corporation. Liquid-filled elastomeric bushings. 4,630,806, Cl. 267-140.100.
Dana Corporation: *See*—
Allmandinger, Donald D.; and Pifer, Richard L., 4,630,506, Cl. 74-713.000.

Danfoss A/S: *See—*
Petersen, Hans C.; and Kyster, Erik, 4,631,010, Cl. 418-61.00B.

Dang, Vu Q.: *See—*
Nguyen, Hung T.; Dang, Vu Q.; Duval, Henry H., Jr.; and Kennedy, Donald J., 4,630,965, Cl. 404-107.000.

Dangschat, Holmer: *See—*
Burkhardt, Horst; Ernst, Alfons; Dangschat, Holmer; and Wogatzke, Horst, 4,631,404, Cl. 250-237.00G.

Daniele, Vincenzo: *See—*
Torelli, Guido; and Daniele, Vincenzo, 4,631,485, Cl. 329-50.000.

Dannhauer, Gunter, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. Portable lamp, adapted to be worn on the head of a user. 4,631,644, Cl. 362-105.000.

Datascope Corp.: *See—*
Wolvek, Sidney; Kaiser, Walter; and Kaltenbach, Kenneth, 4,631,059, Cl. 604-280.000.

Daud, Taher; and Kachare, Akaram H., to United States of America, National Aeronautics and Space Administration. High band gap II–VI and III–V tunneling junctions for silicon multijunction solar cells. 4,631,352, Cl. 136-249.000.

Davey, Jack E., to Blue Giant Equipment of Canada Ltd. Truck restraint system. 4,630,989, Cl. 414-401.000.

Davie, Neil R.: *See—*
Batalden, Glenn D.; Baxter, Duane W.; and Davie, Neil R., 4,631,706, Cl. 365-215.000.

Davis, C. Paul; and Neuman, Eli, to Innovative Computer Products Corporation. Tape cartridge drive head cleaner. 4,631,614, Cl. 360-128.000.

Davis, Paul K., to Pacific Roller Die Co., Inc. Spiral ribbed pipe. 4,630,650, Cl. 138-154.000.

Davis, Walter L.; Prieto, Yolanda; and Smoot, George W., to Motorola, Inc. Self biasing direct coupled data limiter. 4,631,737, Cl. 375-88.000.

Dawn, Ronald C. Vessel with pump suction tube support. 4,630,759, Cl. 222-377.000.

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Jensen, Svend A. K.; Munck, Lars; Sigsgaard, Poul; and Huss, Hans H., 4,631,413, Cl. 250-458.100.

De La Harpe, Jean H., to James Howden & Company Limited. Axial fan. 4,630,999, Cl. 416-167.000.

Dean, George J., Jr.; Klaeser, Robert S.; and Braa, Lloyd W., to Roper Corporation. Drum and cable mechanisms for opening/closing greenhouse vent. 4,630,397, Cl. 49-97.000.

Dean, William P.: *See—*
Walsh, Joseph F.; and Dean, William P., 4,631,698, Cl. 364-900.000.

Deane, Norman P.: *See—*
Blee, Timothy J.; and Deane, Norman P., 4,631,515, Cl. 340-62.000.

DeBonte, William J.: *See—*
Cooke, Theodore M.; and DeBonte, William J., 4,631,557, Cl. 346-140.00R.

Decision-Tree Associates, Inc.: *See—*
Iwamoto, William T., 4,630,681, Cl. 166-366.000.

Decko, Del P.: *See—*
Menne, Eugene P.; Lagerquist, William B.; and Decko, Del P., 4,631,034, Cl. 440-7.000.

Deere & Company: *See—*
Burk, Ronnie F.; Delfs, Larry M.; Gilmore, Michael R.; and Thompson, Warren L., 4,630,526, Cl. 91-452.000.
Schlueter, Francis E.; and Schreiner, Joel M., 4,630,431, Cl. 56-28.000.

DeFreese, Jeffrey A.; and Lind, Theodore E., to Motorola, Inc. Apparatus and method for adjusting the frequency of a resonator by laser. 4,631,197, Cl. 427-10.000.

Degut, Andre, to Societe A. Degut. Apparatus of construction by means of prefabricated elements, particularly of wood. 4,630,418, Cl. 52-264.000.

Deimel, Gerhard: *See—*
Muller, Horst; and Deimel, Gerhard, 4,631,173, Cl. 422-28.000.

Delage, Daniel; and Reboux, Jean, to Saphymo Stel. Magnetic yoke inductor for glass fiber manufacturing equipment. 4,631,381, Cl. 219-10.570.

Delfs, Larry M.: *See—*
Burk, Ronnie F.; Delfs, Larry M.; Gilmore, Michael R.; and Thompson, Warren L., 4,630,526, Cl. 91-452.000.

DeMars, Robert A. Trash can hoop retainer. 4,630,752, Cl. 220-404.000.

Dennis, Christopher J., to Equipaid Limited. Pulse detection. 4,630,613, Cl. 128-687.000.

Denny, John M.: *See—*
Eberle, George F.; Bickel, Karl L.; and Denny, John M., 4,630,424, Cl. 52-693.000.

Dentai, Andrew G.: *See—*
Campbell, Joe C.; and Dentai, Andrew G., 4,631,566, Cl. 357-30.000.

Derrien, Michel: *See—*
Veaux, Jacques; and Derrien, Michel, 4,630,788, Cl. 244-104.0FP.

DeSantis, Albert: *See—*
Meyers, Arthur; and DeSantis, Albert, 4,630,391, Cl. 43-58.000.

deSouza, Alwyn A.; and Oertel, Hans W., to Joslyn Mfg. and Supply Co. Triggerable ceramic gas tube voltage breakdown device. 4,631,453, Cl. 315-340.000.

Detweiler, Charles A., to Tom McGuane Industries, Inc. Check valve and water injection systems and fuel systems utilizing the same. 4,630,642, Cl. 137-506.000.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See—*
Liebing, Lothar, 4,631,398, Cl. 250-216.000.
Sanger, Georg; Hietkamp, Gerrit; and Peschka, Walter, 4,631,096, Cl. 149-1.000.
Tersteegen, Johannes, 4,630,523, Cl. 91-1.000.

Dewald, James R.: *See—*
Tomalia, Donald A.; and Dewald, James R., 4,631,337, Cl. 528-391.000.

de Winter, Walter: *See—*
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Uytterhoeven, Herman; de Winter, Walter; Hoffarth, Gunther; and Richter, Wolfgang, 4,631,243, Cl. 430-114.000.

De Witt, Kenneth I.; and Kovens, Michael L., to Universal Security Instruments, Inc. Transmitter-receiver coded security alarm system. 4,631,527, Cl. 340-539.000.

Dhein, Rolf: *See—*
Blahak, Johannes; Dhein, Rolf; Preis, Lothar; and Schreckenberg, Manfred, 4,631,319, Cl. 525-437.000.

Diamond Oil Well Drilling Company: *See—*
Park, Arthur; and Wilson, Bob T., 4,631,677, Cl. 364-422.000.

DiBartolo, Ernest A., to Sun Hydraulics Corp. Pressure compensated restrictive flow regulator cartridge. 4,630,640, Cl. 137-501.000.

Dicke, Hans-Rudolf: *See—*
Kricheldorf, Hans R.; Pakull, Ralf; and Dicke, Hans-Rudolf, 4,631,333, Cl. 528-170.000.

Dickens, James. Pontoon vehicle. 4,631,037, Cl. 440-100.000.

Dickinson, Vaughan T.: *See—*
Baker, Ralph; Smith, Eric T.; Dickinson, Vaughan T.; McKenzie, Noel C.; and Hargreaves, Brian, 4,631,209, Cl. 427-392.000.

Didier-Werke AG: *See—*
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Diehl, Hermann; Baatz, Gunter; and Machholz, Walter, to Metzeler Schaum GmbH. Roof web for pitched roofs. 4,630,421, Cl. 52-408.000.

Dieleman, Lawrence A. Self-cleaning birdbath apparatus. 4,630,569, Cl. 119-1.000.

Diete, Gunter: *See—*
Hirt, Edmund; Send, Dietmar; and Diete, Gunter, 4,630,729, Cl. 206-363.000.

Dieterich, Frank L. Method for forming a flat band of parallel, contiguous strands. 4,630,652, Cl. 140-92.100.

Dieterich Standard Corporation: *See—*
Parkhurst, Larry E.; and Meadows, Michael R., 4,631,401, Cl. 250-227.000.

Dietrich, Hans-Gerd: *See—*
Bender, Rudolf; Dietrich, Hans-Gerd; and Giebel, Gerhard, 4,630,325, Cl. 12-8.100.

Dietz, Erwin; Munkel, Albert; Hafner, Otmar; Rieper, Wolfgang; and Kroh, Adolf, to Hoechst Aktiengesellschaft. Addition compounds and process for their preparation. 4,631,330, Cl. 528-49.000.

Digital Equipment Corporation: *See—*
Schneider, Guenter, 4,631,611, Cl. 360-106.000.

DiMatteo, Paul: *See—*
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Dimetrics, Inc.: *See—*
Rothermel, Ronald R., 4,631,385, Cl. 219-124.030.

Disselbeck, Dieter; and Stahl, Dieter, to Hoechst Aktiengesellschaft. Sheet-like sandwich molding. 4,631,221, Cl. 428-166.000.

Dixie Union Verpackungen GmbH, Firma: *See—*
Hirt, Edmund; Send, Dietmar; and Diete, Gunter, 4,630,729, Cl. 206-363.000.

Dixon, Michael: *See—*
Grunberg, Robert M.; and Dixon, Michael, 4,630,876, Cl. 339-48.000.

Dr. Ing.h.c.F Porsche Aktiengesellschaft: *See—*
Kamprath, Axel; and Ruehr, Volker, 4,630,471, Cl. 73-146.500.

Dr. Ing. Rudolf Hell GmbH: *See—*
Hoffrichter, Ingo; and Jung, Eggert, 4,631,579, Cl. 358-80.000.

Dolbeare, Richard T., to United States of America, Air Force. Vibration isolated cold plate assembly. 4,631,635, Cl. 361-383.000.

Dolland, Carlisle R., to United States of America, Air Force. High or low-side state relay with current limiting and operational testing. 4,631,474, Cl. 324-73.00R.

Domanski, Lothar: *See—*
Heintzmann, Peter; Koppers, Manfred; Bohnes, Karlheinz; and Domanski, Lothar, 4,630,973, Cl. 405-288.000.

Dommer, Erich; and Groos, Heinrich, to Berkenhoff GmbH. Wire electrode for spark-eroding systems. 4,631,237, Cl. 428-621.000.

Donahue, Robert L., to Hein-Werner Corporation. Hole gauge. 4,630,380, Cl. 33-288.000.

Donald, Raymond G., to Signetics Corporation. Method for manufacturing a narrow line of photosensitive material. 4,631,113, Cl. 156-659.100.

Dooling, David J.: *See—*
Coyne, Joan H.; Dooling, David J.; Miller, Louis E.; and Nalbone, Robert D., 4,631,364, Cl. 379-164.000.

Doshi, Pratap K.: *See—*
Wilson, John F.; and Doshi, Pratap K., 4,631,165, Cl. 376-333.000.

Dougherty, Edward M.: *See—*
Hartman, Russell D.; and Dougherty, Edward M., 4,630,697, Cl. 177-211.000.

Dow Chemical Company, The: *See—*
Akers, James R., Jr.; Leng, Douglas E.; and Normand, Randall J., 4,631,175, Cl. 422-135.000.
Bierschenk, Thomas R., 4,631,200, Cl. 427-113.000.
Graham, Stephen L.; Plunkett, David O.; and Lacey, Robert S., 4,631,308, Cl. 524-272.000.
Hay, Robert A., II, 4,631,016, Cl. 425-224.000.

Kan, Charles S., 4,631,233, Cl. 428-420.000.
Mayes, M. Dale, 4,630,939, Cl. 374-135.000.
McCullough, Francis P.; and Snelgrove, Roy V., 4,631,118, Cl. 204-16.000.
Meyer, Gerhard A., 4,630,924, Cl. 356-316.000.
Parker, Theodore L., 4,631,331, Cl. 528-96.000.
Parker, Theodore L., 4,631,332, Cl. 528-117.000.
Tomalia, Donald A.; and Dewald, James R., 4,631,337, Cl. 528-391.000.
Trevino, Jose L.; and van Rooden, Bernardus J., 4,631,312, Cl. 525-221.000.
Tung, Lu H.; and Griggs, Jerald A., 4,631,313, Cl. 525-250.000.
Tung, Lu H.; and Griggs, Jerald A., 4,631,314, Cl. 525-314.000.

Dow Chemical Japan Limited: *See—*
Kozuma, Jiro; Hamaguchi, Hirohiko; Shibahara, Tetsuya; and Strasser, Joseph P., 4,631,301, Cl. 523-122.000.

Dow Corning Corporation: *See—*
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Battice, David R.; and Hales, Michael G., 4,631,297, Cl. 521-78.000.
Bauman, Therese M.; and Freiberg, Alan L., 4,631,296, Cl. 521-65.000.
Blehm, Lynne; Makek, James R.; and White, W. Curtis, 4,631,273, Cl. 514-29.000.
Chandra, Grish; and Kwai Lo, Peter Y., 4,631,310, Cl. 524-862.000.
Gornowicz, Gerald A.; and Lee, Chi-Long, 4,631,329, Cl. 528-28.000.

Dow Corning Ltd.: *See—*
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Dowell Schlumberger Incorporated: *See—*
Reeves, Henry C., III; Potter, Gary F.; and Riley, Suzanne M., 4,630,679, Cl. 166-305.100.

Dragerwerk AG: *See—*
Pasternack, Adalbert, 4,630,605, Cl. 128-205.240.
Weerda, Hilko; and Pedersen, Peter, 4,630,606, Cl. 128-207.140.

Dragone, Corrado, to AT&T Bell Laboratories. Antenna arrangement capable of astigmatism correction. 4,631,545, Cl. 343-779.000.

Dreckmann, Karl; and Miesen, Theo, to Lemo M Lehmacher & Sohn GmbH Maschinenfabrik. Apparatus for cutting hand holes in bags. 4,631,047, Cl. 493-227.000.

Drescher, Robert D.; Eisenhaure, David B.; Hockney, Richard L.; Johnson, Bruce G.; St. George, Emery, Jr.; and Whipple, David C., to Charles Stark Draper Laboratory, Inc., The. Inertial energy storage device and synchronous rotary electrical machine for use therein. 4,631,456, Cl. 318-140.000.

Dresser Industries, Inc.: *See—*
Eckman, Richard E., 4,631,012, Cl. 418-70.000.

Drewel, Gunter; Enoch, Horst; and Grotkasten, Klaus, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Hydraulic curing press. 4,631,014, Cl. 425-34.00R.

Drosemeyer, Hans-Heinrich: *See—*
Keiler, Manfred; Bartsch, Uwe; Drosemeyer, Hans-Heinrich; and Reitsam, Franz X., 4,630,382, Cl. 34-173.000.

Dubar, Thierry, to Les Cables de Lyon. Multiple joint for underwater optical fiber cables. 4,630,888, Cl. 350-96.230.

Duckman, Curt: *See—*
Duckman, Donald; Duckman, Curt; and Andren, Kjell, 4,630,564, Cl. 114-98.000.

Duckman, Donald; Duckman, Curt; and Andren, Kjell. Boom control device for a sailboat boom. 4,630,564, Cl. 114-98.000.

Duckworth, Allen, to Teleco Oilfield Services Inc. Vibration isolator and shock absorber device. 4,630,809, Cl. 267-141.100.

Duddridge, John E.; and Kent, Christopher A., to United Kingdom Atomic Energy Authority. Treating a medium. 4,631,135, Cl. 210-764.000.

Duerig, Tom: *See—*
Simpson, John A.; Melton, Keith; and Duerig, Tom, 4,631,094, Cl. 148-11.50F.

Duffers Scientific, Inc.: *See—*
Ferguson, Hugo S., 4,631,697, Cl. 364-900.000.

Duffie, Kenneth G.: *See—*
Sagemuehl, Hans W.; and Duffie, Kenneth G., 4,630,321, Cl. 2-426.000.

Duinker, Simon; and Mulder, Hendrik, to N.V. Optische Industrie "De Oude Delft" . Apparatus for the non-contact disintegration of stony objects present in a body by means of sound shockwaves. 4,630,607, Cl. 128-328.000.

Dumas, Ted A.; and Griffee, Les V., to Rockwell International Corporation. Electronically rotated antenna apparatus. 4,631,546, Cl. 343-833.000.

Dummermuth, Paul, to Von Arx AG. Percussion device. 4,630,687, Cl. 173-131.000.

Du Pont de Nemours, E. I., and Company: *See—*
Bennett, Allyn N., 4,631,246, Cl. 430-271.000.
Chouinard, Michael P.; and Bancroft, Lewis C., 4,631,602, Cl. 360-16.000.
Eveleigh, John W., 4,631,205, Cl. 427-255.600.
Mitchell, Robert D., 4,631,244, Cl. 430-137.000.
Valteris, Ramunas L.; and Caldwell, Gary L., 4,631,018, Cl. 425-445.000.
van Alst, Wilhelmus B. T., 4,630,879, Cl. 339-99.00R.
Williston, David W., 4,631,111, Cl. 156-630.000.

Durac Limited: *See—*
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Durametallic Corporation: *See—*
Kakabaker, Kenneth G., 4,630,458, Cl. 72-237.000.

Durand, Remie P., to Chrysler Motors Corporation. Tab redundant terminal. 4,630,880, Cl. 339-176.00L.

Duren, Karl: *See—*
Kranz, Eckhard; and Duren, Karl, 4,630,351, Cl. 29-527.200.

Durr, Paul, to Hilti Aktiengesellschaft. Adjustable motor-operated screw driving device. 4,630,512, Cl. 81-475.000.

Duval, Henry H., Jr.: *See—*
Nguyen, Hung T.; Dang, Vu Q.; Duval, Henry H., Jr.; and Kennedy, Donald J., 4,630,965, Cl. 404-107.000.

Duvernay, Maurice: *See—*
Laisney, Bernard; and Duvernay, Maurice, 4,631,299, Cl. 521-77.000.

Dvorak, Robert F.; Jansen, Harley W.; and Zylstra, Henry J., to Square D Company. Time delay undervoltage release. 4,631,624, Cl. 361-89.000.

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Zoludow, Richard S., 4,631,374, Cl. 200-61.210.

Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Herbst, Thomas; and Schitzler, Lorenz, 4,630,971, Cl. 405-260.000.

Dye, John F., to Kendall Company, The. Tamper discouraging system. 4,631,056, Cl. 604-111.000.

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Wingate, Sidney A., 4,631,520, Cl. 340-347.0CC.

Dynatrans Technology Ltd.: *See—*
Bjurling, Anders, 4,630,855, Cl. 294-81.210.

Eastern Company: *See—*
Kincaid, Herbert; and Favia, Alan D., 4,630,457, Cl. 70-369.000.

Easthill, Stephen P., to U.S. Philips Corporation. Method of and apparatus for controlling a domestic appliance. 4,631,658, Cl. 364-184.000.

Eastman Kodak Company: *See—*
Braun, Hilarion; Lush, Linda; and Lehman, Scott, 4,631,549, Cl. 346-1.100.
French, William W., 4,631,613, Cl. 360-125.000.
Piatt, Michael J.; and Brown, Mark E., 4,631,550, Cl. 346-1.100.
Spaller, Albert E., 4,630,515, Cl. 83-402.000.
Vergona, Albert B., 4,631,551, Cl. 346-108.000.

Eaton Corporation: *See—*
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Vendelin, George D.; and Rezvani, Behruz, 4,631,493, Cl. 330-277.000.

Ebata, Yoshihiro; Kose, Saburo; and Hayami, Ryozo, to Agency of Industrial Science & Technology. Method for adhesion of oxide type ceramics with copper or alloy thereof. 4,631,099, Cl. 156-89.000.

Eberle, George F.; Bickel, Karl L.; and Denny, John M., to Lumbermate Company. Top hung truss. 4,630,424, Cl. 52-693.000.

Ecer, Gunes M., to CDP, Ltd. Consolidation of a drilling element from separate metallic components. 4,630,692, Cl. 175-330.000.

Echegoyen, Luis: *See—*
Gokel, George W.; and Echegoyen, Luis, 4,631,119, Cl. 204-59.00R.

Eckman, Richard E., to Dresser Industries, Inc. Pneumatic tools. 4,631,012, Cl. 418-70.000.

Eckstrom, William R.; and Conrad, John R., to Travel-Aire, Inc. Filtering systems for buses. 4,630,530, Cl. 98-2.110.

Edelstein, William A.: *See—*
Mueller, Otward M.; and Edelstein, William A., 4,631,495, Cl. 330-310.000.

Edinger, Egon; and Schade, Reinhart, to Siemens Aktiengesellschaft. Transducer plate for piezoelectric transducers. 4,631,436, Cl. 310-322.000.

Eibach, Wolfgang; Roehr, Kuno M.; and Schulz, Klaus M., to International Business Machines Corporation. Fail-safe data processing system. 4,631,661, Cl. 364-200.000.

Eickmann, Karl. Fluid motor with arresting and disarresting means. 4,630,528, Cl. 91-491.000.

Eiken Kagaku Kabushiki Kaisha: *See—*
Takino, Kiyoko; Asahi, Hidetoshi; and Wada, Hiroshi, 4,631,255, Cl. 435-37.000.

Eisenhaure, David B.: *See—*
Drescher, Robert D.; Eisenhaure, David B.; Hockney, Richard L.; Johnson, Bruce G.; St. George, Emery, Jr.; and Whipple, David C., 4,631,456, Cl. 318-140.000.

Elbaum, Saul. Design painting device with stability and independent drive. 4,630,952, Cl. 401-48.000.

Elco Industries, Inc.: *See—*
Reinwall, Ernest W.; and Spibey, John, 4,630,984, Cl. 411-368.000.

Elger, Walter: *See—*
Vorbruggen, Helmut; Elger, Walter; Town, Michael-Harold; and Schillinger, Ekkehard, 4,631,276, Cl. 514-211.000.

Eli Lilly and Company: *See—*
Beck, James R., 4,631,343, Cl. 546-279.000.
Robertson, David W., 4,631,279, Cl. 514-247.000.
Wheeler, William J., 4,631,339, Cl. 540-492.000.

Elkins, Hubert L., to Hydril Company. Well control method and apparatus. 4,630,680, Cl. 166-34.200.

Ellersick, Russell R. Furnace wall lining composition and the use thereof. 4,630,594, Cl. 126-64.000.

Elliott, George A., to RCA Corporation. Automatic coaxial cable bending apparatus. 4,630,459, Cl. 12-307.000.

Ellis, James R.: *See—*
Wilson, James A.; and Ellis, James R., 4,630,570, Cl. 119-20.000.

Elms, Robert T.: *See—*
Lagree, James L.; and Elms, Robert T., 4,631,450, Cl. 315-244.000.
El-Sherbini, Ahmed M., to Wang Laboratories, Inc. Method and apparatus for differential run-length coding. 4,631,521, Cl. 340-347.0DD.
Embree, Milton L.: *See—*
Arntsen, Tom D.; Embree, Milton L.; Havens, Joseph H.; and Toumani, Rouben, 4,631,362, Cl. 379-384.000.
Emhart Industries, Inc.: *See—*
Handel, Martin G.; Robida, James E.; and Slusarski, Ronald S., 4,631,528, Cl. 340-545.000.
Hodges, C. Wayne; and Limanowski, Jozef K., 4,631,631, Cl. 361-306.000.
Emoto, Kazuhiro; Haino, Kozo; and Itoh, Akira, to Mitsubishi Paper Mills, Ltd. Bisazo electrophotographic sensitive materials with —CF_3 group. 4,631,242, Cl. 430-58.000.
Endo, Haruyoshi: *See—*
Makimoto, Mitsuo; Endo, Haruyoshi; and Yamashita, Sadahiko, 4,631,506, Cl. 333-224.000.
Endo, Takashi: *See—*
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Energy Conversion Devices, Inc.: *See—*
Johnson, Robert R., 4,630,355, Cl. 29-575.000.
Engdahl, Paul D. Peak accelerograph. 4,630,483, Cl. 73-652.000.
Engel, Michael J.: *See—*
Baker, Roy A.; Costello, Rocky C.; and Engel, Michael J., 4,631,068, Cl. 23-293.00S.
Engel, Walter; Hoppe, Udo; and Sauermann, Gerhard, to Beiersdorf Aktiengesellschaft. Functional oil-cream bath. 4,631,295, Cl. 514-558.000.
Engelhard Corporation: *See—*
Altomare, Carol A., 4,631,262, Cl. 502-65.000.
English China Clays Lovering Pochin & Co. Ltd.: *See—*
Goodman, Howard, 4,631,091, Cl. 106-308.00N.
English, George J.; Gagnon, Peter R.; and Leadvaro, Stephen J., to GTE Products Corporation. Single-ended high intensity discharge lamp. 4,631,446, Cl. 313-634.000.
Engstrom, Bjorn M. H.; and Bernander, Karl-Gustav. Collapse preventing connection device for building structures. 4,630,412, Cl. 52-1.000.
Enoch, Horst: *See—*
Drewel, Gunter; Enoch, Horst; and Grotkasten, Klaus, 4,631,014, Cl. 425-34.00R.
Environmental Fragrance Technologies, Ltd.: *See—*
Glucksman, Dov Z., 4,631,387, Cl. 219-272.000.
Equipaid Limited: *See—*
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Erhardt, Manfred; Loos, Herbert; Lohrer, Josef; Schapp, Udo; Schaeferling, Karl-Josef; and Freundl, Walter, to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co. Apparatus for the manufacture or machining of straight or helically toothed workpieces. 4,630,402, Cl. 51-105.0GG.
Erhardt, Manfred; and Loos, Herbert, to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co. Apparatus for manufacturing and machining gears. 4,630,404, Cl. 51-105.0GG.
Erickson, Leif O.; and Leonard, Vurnen J., to Minnesota Mining and Manufacturing Company. Stretched surface recording disk substrate. 4,631,609, Cl. 360-135.000.
Ernst, Alfons: *See—*
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Ahs, Wilgot, 4,630,865, Cl. 297-284.000.
Eschner, Axel, to Didier-Werke AG. Method and apparatus for reducing the temperature of air. 4,631,074, Cl. 55-27.000.
Essex Group, Inc.: *See—*
Lavallee, Francois A., 4,631,201, Cl. 427-118.000.
Etemovich, Alex, to TRE Corporation. Chromate free method of treating metal substrates to impart corrosion resistance and color to the substrate surface. 4,631,093, Cl. 148-6.100.
Ethyl Corporation: *See—*
Goins, Dixie E.; Holmes, Silas W.; and Burt, Edward A., 4,631,349, Cl. 568-789.000.
Presswood, J. Kenneth, 4,631,298, Cl. 521-163.000.
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Etzbach, Karl H.: *See—*
Ringsdorf, Helmut; Portugall, Michael; Schmidt, Hans W.; and Etzbach, Karl H., 4,631,328, Cl. 526-259.000.
Eubanks, Furney M. Elevatable work station. 4,630,710, Cl. 182-116.000.
Evans Cooling Associates: *See—*
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Evans, John W., to Evans Cooling Associates. Boiling liquid cooling system for internal combustion engines. 4,630,572, Cl. 123-41.210.
Evans, Lawrence J.: *See—*
Gabriel, Steven A.; and Evans, Lawrence J., 4,631,750, Cl. 382-41.000.
Evans, Philip R.: *See—*
Young, Ian R.; Evans, Philip R.; and Luker, Peter A., 4,631,481, Cl. 324-320.000.
Eveleigh, John W., to Du Pont de Nemours, E. I., and Company. Process for producing coherent films of polyacetylene. 4,631,205, Cl. 427-255.600.
Everett, Charles J.: *See—*
Ochsner, Rolf H.; and Everett, Charles J., 4,630,360, Cl. 29-622.000.
Evers, Reinhard; and Wenzel, Werner, to Nordischer Maschinenbau Rud. Device for aligning fish. 4,630,334, Cl. 17-56.000.
Ewikon Entwicklung und Konstruktion GmbH & Co.KG: *See—*
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Exxon Printing Systems, Inc.: *See—*
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Exxon Production Research Co.: *See—*
Gunderson, Richard H.; Gardner, Terry N.; and Guile, Peter J. D., 4,630,970, Cl. 405-224.000.
Fabriques de Tabac Reunies, S.A.: *See—*
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Fairchild Camera & Instrument Corp.: *See—*
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Fairey Hydraulics Limited: *See—*
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Fang, Shou-Mean: *See—*
O'Brien, Michael T.; Sopory, Umesh K.; and Fang, Shou-Mean, 4,631,392, Cl. 219-549.000.
Fantuzzo, Joseph; and Monkelbaan, Edwin R., to Xerox Corporation. Selectable color system. 4,630,919, Cl. 355-4.000.
Fanuc Ltd: *See—*
Fukuyama, Hiroomi; Hattori, Kiyoshi; and Nakashima, Yoshihiro, 4,631,465, Cl. 318-565.000.
Faris, Sadeg M., to International Business Machines Corporation. Ultra high resolution Josephson sampling technique. 4,631,423, Cl. 307-352.000.
Farmitalia Carlo Erba S.p.A.: *See—*
Battistini, Carlo; Foglio, Maurizio; Franceschi, Giovanni; and Scarafile, Cosimo, 4,631,150, Cl. 540-310.000.
Farquharson, Graeme J.: *See—*
Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; Conway, Richard J.; and Tucker, Peter G., 4,631,081, Cl. 71-94.000.
Farrington, Richard I.: *See—*
Amici, Francis R.; Farrington, Richard I.; and Piazza, Pietro, 4,630,756, Cl. 222-78.000.
Faust, Daniel P., to General Motors Corporation. Strip roll forming energy absorbing device. 4,630,716, Cl. 188-371.000.
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Kincaid, Herbert; and Favia, Alan D., 4,630,457, Cl. 70-369.000.
Fear, Robert E., to Continental Bondware, Inc. Product indicating tab. 4,630,733, Cl. 206-459.000.
Federico, Joseph; and Waaben, Sigurd G., to AT&T Bell Laboratories. Telautograph system. 4,631,355, Cl. 178-18.000.
Feldman, Alan, to Sperry Corporation. Angular position to linear voltage converter. 4,631,540, Cl. 340-870.380.
Fellerman, Bernard F.: *See—*
Crossley, Peter W.; Fellerman, Bernard F.; and Goodchild, Graham H., 4,631,390, Cl. 219-449.000.
Felsner, Fritz; and Geier, Erich, to U.S. Philips Corporation. Box for holding circuit boards. 4,631,638, Cl. 361-415.000.
Felt Products Mfg. Co.: *See—*
Locacius, Robert F., 4,630,835, Cl. 277-235.00B.
Fenner, James A., to Boeing Company, The. Cargo tie-down system. 4,630,982, Cl. 410-102.000.
Ferguson, Hugo S., to Duffers Scientific, Inc. Signal controlled waveform recorder. 4,631,697, Cl. 364-900.000.
Feriani, Mariano; and Biasioli, Stefano, to Fresenius, AG. Container for a bicarbonate containing fluid. 4,630,727, Cl. 206-221.000.
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Ferodo Ltd.: *See—*
Baker, Ralph; Smith, Eric T.; Dickinson, Vaughan T.; McKenzie, Noel C.; and Hargreaves, Brian, 4,631,209, Cl. 427-392.000.
Ferraro, Michael J. Bait station. 4,630,392, Cl. 43-131.000.
Ferraz: *See—*
Cinquin, Jean P.; Gazzolo, Christian; and Pisciotta, Michel, 4,631,508, Cl. 335-142.000.
Ferri, John L.; Fulkerson, William C.; Newman, Ray L.; and Gonzalez, Jeffrey M., to GTE Products Corporation. Heat recuperator with compensator for pressure operated fuel regulator. 4,631,022, Cl. 431-90.000.
Ferrofluidics Corporation: *See—*
Stahl, Philip; Wilcock, Donald F.; and Fuller, Dudley D., 4,630,943, Cl. 384-133.000.
Fesko, Donald G., to Ford Motor Company. Leaf spring clamp for synthetic material leaf spring. 4,630,804, Cl. 267-52.000.
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Figueroa, Luis: *See—*
Goodwin, Frank E.; Law, Hsiang-Yi D.; Morrison, Charles B.; and Figueroa, Luis, 4,631,729, Cl. 372-44.000.
Findling, Josef, to GEA Wiegand GmbH. Liquid dispersal device. 4,630,776, Cl. 239-553.300.
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Firestone Tire & Rubber Company, The: *See—*
Bell, Thomas W.; and Shurman, Louis W., 4,630,663, Cl. 152-541.000.
Beneze, Heinz W., 4,630,422, Cl. 52-410.000.
Fischer, Artur. Expansion pin. 4,630,983, Cl. 411-15.000.
Fisher, Ernest P., Jr.: *See—*
Boyle, William G.; and Fisher, Ernest P., Jr., 4,630,833, Cl. 277-188.00A.
Fisher, Glen W.; Helweg, Lionel C.; and Jones, Rick S. Flow sensor for particulate material. 4,630,489, Cl. 73-861.870.
Fisler, Alfred E. Switching system for readily accessing the service line for test basic unit and the switching system for readily accessing the service line for test expansion unit. 4,631,368, Cl. 379-29.000.
Fleischer, Donald W.; and Smilgys, Bruno S., to Veeder Industries, Inc. Storage tank flow control valve assembly. 4,630,655, Cl. 141-198.000.
Fletcher, James D. Two-wheeled motor vehicle assembly. 4,630,703, Cl. 180-219.000.
Fletcher, Jo Ann. Surgical vest. 4,630,610, Cl. 128-501.000.
Fligsten, Ann M.: *See—*
Fligsten, Kenneth E.; and Fligsten, Ann M., 4,630,324, Cl. 5-94.000.
Fligsten, Kenneth E.; and Fligsten, Ann M. Traveling reclining restraint and collision-protection device. 4,630,324, Cl. 5-94.000.
Flohr, Mark C.: *See—*
Neipling, Lawrence E.; and Flohr, Mark C., 4,630,675, Cl. 166-53.000.
Flonic: *See—*
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FMC Corporation: *See—*
Braksmayer, Diza P.; Lee, Fui-Tseng H.; and Scholer, Fred R., 4,631,148, Cl. 252-609.000.
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Foglio, Maurizio: *See—*
Battistini, Carlo; Foglio, Maurizio; Franceschi, Giovanni; and Scarafile, Cosimo, 4,631,150, Cl. 540-310.000.
Fok, Kam-Fook: *See—*
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Follansbee Steel Corporation: *See—*
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Fondation Cousteau: *See—*
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Fesko, Donald G., 4,630,804, Cl. 267-52.000.
Zweiniger, Hansjurgen; and Willenbrock, Horst, 4,630,857, Cl. 296-37.120.
Foreman, Adele J. Hair rolling device. 4,630,622, Cl. 132-39.000.
Forker, Dieter; Hassler, Joachim; Lau, Bernhard; and Schmidt, Rolf, to Standard Elektrik Lorenz AG. Apparatus for measuring the position of a light source disposed inside a lighthouse. 4,630,909, Cl. 354-1.000.
Foroni, Mario; and Bertotti, Franco, to SGS-ATES Componenti Elettronici SpA. Semiconductor overvoltage suppressor with accurately determined striking potential. 4,631,561, Cl. 357-13.000.
Fortenberry & Associates, Inc.: *See—*
Fortenberry, Jerry B., 4,630,746, Cl. 220-6.000.
Fortenberry, Jerry B., to Fortenberry & Associates, Inc. Collapsible stackable shipping container. 4,630,746, Cl. 220-6.000.
Foschini, Gerard J., to AT&T Bell Laboratories. Cross-polarization canceler/equalizer. 4,631,734, Cl. 375-15.000.
Fosnacht, Donald R.: *See—*
Rellis, Daniel, Jr.; Fosnacht, Donald R.; and Jackson, Charles R., 4,630,801, Cl. 266-216.000.
Foster, Robert W.; and Weekly, Max D., to AT&T Bell Laboratories. Method and apparatus for incremental load simulation. 4,631,363, Cl. 379-15.000.
Fouad, Fakhry A.; Kakalec, Robert J.; and Menkes, Henry E., to AT&T Bell Laboratories. Inductor apparatus for application of ferroresonant regulators. 4,631,471, Cl. 323-306.000.
Fournier, Erick-Pierre: *See—*
Strickman, Melvyn B.; and Fournier, Erick-Pierre, 4,630,602, Cl. 128-127.000.
Fowler, David E.: *See—*
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Fowler, John T., to Laitram Corporation, The. System for removably housing and aligning components in a towed array. 4,631,711, Cl. 367-149.000.
Fraenkel, Herbert: *See—*
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Franceschi, Giovanni: *See—*
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Frankenberg, Robert E.; and Calderazzo, Mark A., to Sewell Plastics, Inc. Segmented blow pin for molding machines employing replaceable cutting ring. 4,631,020, Cl. 425-527.000.
Franklin, Andrew D.; Hasley, Lloyd A.; and Smith, James E., to AT&T Information Systems Inc. Distributed packet switching system. 4,631,534, Cl. 340-825.500.
Franz, Hans-Joachim; Schmidt, Willy; and Sadler, Karl O., to Blohm & Voss AG. Ship having standardized access ways. 4,630,561, Cl. 114-1.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef; and Hansmann, Johann, 4,630,541, Cl. 104-7.200.
Franz, Robert M.: *See—*
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Frattolillo, Antonio P. A., to Fabriques de Tabac Reunies, S.A. Apparatus for producing a rod-like smoking article with secondary air channels. 4,631,045, Cl. 493-46.000.
Freed, Paul S.: *See—*
Kantrowitz, Adrian; and Freed, Paul S., 4,630,597, Cl. 128-1.00D.
Freiberg, Alan L.: *See—*
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Freitag, Dieter: *See—*
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French, William W., to Eastman Kodak Company. Thin film head having improved saturation magnetization. 4,631,613, Cl. 360-125.000.
Fresenius, AG: *See—*
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Freundl, Walter: *See—*
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Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
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Friedlander, Mordechai: *See—*
Malka, Jacob H.; and Friedlander, Mordechai, 4,631,484, Cl. 328-63.000.
Friedman, Daniel J. Apparatus for supporting the weight of a banjo in adjustable proportions from both the torso and the shoulders of a player. 4,630,763, Cl. 224-259.000.
Friedman, Moshe; and Serlin, Victor, to United States of America, Navy. IREB converter to AC pulses. 4,631,447, Cl. 315-5.000.
Frielinghaus, Klaus H., to General Signal Corporation. Railway wheel detector. 4,630,792, Cl. 246-369.000.
Frommer, Myron H.: *See—*
Shaulov, Avner A.; Lukasik, Stanley J.; Frommer, Myron H.; and Zwicker, Walter K., 4,631,633, Cl. 361-321.000.
Frutschi, Hansulrich, to BBC Brown, Boveri & Company, Limited. Air storage gas turbine power station with fluidized bed firing. 4,630,436, Cl. 60-39.183.
Fry, Merle A. Weed cutting and extracting tool. 4,630,366, Cl. 30-124.000.
Frykendahl, Bjorn, to IFM Development AB. Nozzle for injection lance. 4,630,802, Cl. 266-225.000.
Fuerst, Arpad; and Lutz, Alfons, to Webasto-Werk W. Baier GmbH & Co. Vehicle roof cover and wind deflector. 4,630,860, Cl. 296-217.000.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Kobayashi, Toshio, 4,630,705, Cl. 180-247.000.
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, 4,630,704, Cl. 180-247.000.
Fuji Photo Film Co., Ltd.: *See—*
Kawajiri, Kazuhiro; Sunagawa, Hiroshi; Nozaki, Nobuharu; Hosoi, Yuichi; and Takahashi, Kenji, 4,631,407, Cl. 250-327.200.
Kondo, Asaji, 4,631,174, Cl. 422-56.000.
Mifune, Hiroyuki; Nakamura, Koki; and Ishiguro, Shoji, 4,631,253, Cl. 430-569.000.
Mitsuo, Hirofumi, 4,631,204, Cl. 427-150.000.
Nishizawa, Jun-ichi, 4,631,592, Cl. 358-213.000.
Oishi, Kengo; and Katagiri, Shingo, 4,631,620, Cl. 360-133.000.
Fuji Photo Optical Co., Ltd.: *See—*
Ishiguro, Minoru; Kaneko, Kouji; and Kondo, Toru, 4,630,916, Cl. 354-418.000.
Fuji Xerox Co., Ltd.: *See—*
Miyao, Fumio, 4,631,718, Cl. 370-4.000.
Fujii, Noriki: *See—*
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,631,717, Cl. 369-276.000.
Fujikin International, Inc.: *See—*
Ogawa, Susumu, 4,630,851, Cl. 285-341.000.
Fujikura, Yoshiaki: *See—*
Matsumoto, Kiyoshi; Fujikura, Yoshiaki; and Nakajima, Motoki, 4,631,147, Cl. 252-522.00R.
Fujimori, Hiroyoshi: *See—*
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,631,582, Cl. 358-98.000.
Fujioka, Souichirou; Inaji, Toshio; and Yamamoto, Susumu, to Matsushita Electric Industrial Co., Ltd. Brushless DC motor. 4,631,459, Cl. 318-254.000.
Fujisawa Pharmceutical Co., Ltd.: *See—*
Takaya, Takao; Sakane, Kazuo; Yamanaka, Hideaki; and Miyai, Kenzi, 4,631,274, Cl. 514-202.000.
Fujitsu Limited: *See—*
Kokado, Masayuki; and Sumi, Hidezi, 4,631,567, Cl. 357-38.000.
Takamura, Moriyuki; Mukasa, Shigeru; and Ibi, Takashi, 4,631,725, Cl. 371-39.000.
Takato, Kenji; Ayano, Mitsutoshi; Shibuya, Kiyoshi; Iijima, Yoshimi; and Serikawa, Atsuo, 4,631,366, Cl. 340-333.000.

Fujiwara, Hideo: *See—*
Shiiki, Kazuo; Shiroishi, Yoshihiro; Yuito, Isamu; Shinagawa, Kiminari; Uesaka, Yasutaro; Fujiwara, Hideo; and Nakamura, Hitoshi, 4,631,612, Cl. 360-125.000.

Fujiwara, Tatsuo, to Nippon Air Brake Co., Ltd. Malfunction detection arrangement for jerk controlled brake command system. 4,631,514, Cl. 340-52.00R.

Fukui, Kunihiro; Nishihara, Minoru; Mase, Toshiro; Morita, Yoshiyasu; and Kawashima, Hisakazu, to Sumitomo Metal Industries, Ltd. Oil well pipe joint. 4,630,849, Cl. 285-55.000.

Fukui, Noboru: *See—*
Tamba, Shinichi; Ogino, Toru; and Fukui, Noboru, 4,631,153, Cl. 261-52.000.

Fukui, Tsutomu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Time-axis correcting circuit for recorded data reproducing device. 4,631,600, Cl. 358-320.000.

Fukunaga, Tokio; Magara, Takuji; Sakabe, Shigekazu; Aramaki, Jun; Karashima, Toshiharu; and Ushida, Minoru, to Mitsubishi Denki Kabushiki Kaisha. Bed for electrical discharge machining apparatus. 4,631,382, Cl. 219-69.00R.

Fukutomi, Yohji: *See—*
Hashiguchi, Makoto; and Fukutomi, Yohji, 4,630,589, Cl. 123-571.000.

Fukuvi Chemical Industry Co., Ltd.: *See—*
Hasegawa, Hiroaki, 4,631,214, Cl. 428-68.000.

Fukuyama, Hiroomi; Hattori, Kiyoshi; and Nakashima, Yoshihiro, to Fanuc Ltd. Tool display system of automatic tool changing apparatus. 4,631,465, Cl. 318-565.000.

Fukuyama, Ryoji: *See—*
Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hironobu; Omoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, 4,631,106, Cl. 156-345.000.

Fulkerson, Emmet M., to General Electric Company. Optical projector. 4,630,927, Cl. 356-372.000.

Fulkerson, William C.: *See—*
Ferri, John L.; Fulkerson, William C.; Newman, Ray L.; and Gonzalez, Jeffrey M., 4,631,022, Cl. 431-90.000.

Fuller, Dudley D.: *See—*
Stahl, Philip; Wilcock, Donald F.; and Fuller, Dudley D., 4,630,943, Cl. 384-133.000.

Furey, Andrew J.: *See—*
Kulp, Rodney J.; and Furey, Andrew J., 4,630,378, Cl. 33-185.00R.

Furlong, Donn B. Detachable swivel for coupling gangions to longlines and apparatus for automatically attaching same. 4,630,388, Cl. 43-27.400.

Furst, Leander; Ballast, Johan T. G.; and Jahnel, Kurt, to Kernforschungsanlage Julich GmbH; and Brooks Instrument, Zweigniederlassung Elmshorn der Emerson Electric GmbH. Gas flow regulator for gases with condensable components. 4,630,637, Cl. 137-340.000.

Furuichi, Tokinori, to Hitachi, Ltd. Current control type circuit for brushless motor. 4,631,458, Cl. 318-254.000.

Furuyama, Masatosi: *See—*
Matsumoto, Mitsuaki; Furuyama, Masatosi; Tomioka, Tadao; Sunago, Hirofumi; and Higuchi, Masakazu, 4,631,181, Cl. 423-449.000.

Futaire Limited: *See—*
Toll, Ian C., 4,630,864, Cl. 297-232.000.

Fyfe, Leo W.; and Seaman, A. Matthew, to Cutters Exchange, Inc. Apparatus for applying fastener tape to fabric pieces. 4,630,364, Cl. 29-779.000.

G.D. Societa per Azioni: *See—*
Neri, Armando, 4,631,693, Cl. 364-550.000.

G. H. Stenner & Co., Inc.: *See—*
Stenner, Gustav H., 4,631,008, Cl. 417-477.000.

Gabriel, Naeem B. Cigarette with condensing surface therein. 4,630,620, Cl. 131-331.000.

Gabriel, Steven A.; and Evans, Lawrence J., to Ampex Corporation. Method and system for spacially transforming images. 4,631,750, Cl. 382-41.000.

Gadd, Helen E. Bingo game card holder. 4,630,830, Cl. 273-240.000.

Gagnon, Peter R.: *See—*
English, George J.; Gagnon, Peter R.; and Leadvaro, Stephen J., 4,631,446, Cl. 313-634.000.

Galeski, Andrzej: *See—*
Piorkowska-Palczewska, Ewa; Galeski, Andrzej; and Kryszewski, Marian, 4,630,938, Cl. 374-44.000.

Galle, Edward M.; and Baker, Billey E., to Hughes Tool Company-USA. Downhole pressure fluctuating tool. 4,630,689, Cl. 175-56.000.

Gamm, Robert J., to Kangaroos U.S.A., Inc. Shoe with gusset pocket. 4,630,383, Cl. 36-136.000.

Ganguli, Keshab L.: *See—*
Oudejans, Johannes C.; Nootenboom, Peter; Ganguli, Keshab L.; and Lok, Cornelis M., 4,631,265, Cl. 502-259.000.

Ganzle, Hartmut: *See—*
Reule, Hans; and Ganzle, Hartmut, 4,631,442, Cl. 313-414.000.

Gardiner, Gregory E.: *See—*
Andrews, Henry L.; and Gardiner, Gregory E., 4,631,082, Cl. 75-235.000.

Gardner, Neal F., to TRW Inc. Bipolar transistor construction. 4,631,568, Cl. 357-49.000.

Gardner, Terry N.: *See—*
Gunderson, Richard H.; Gardner, Terry N.; and Guile, Peter J. D., 4,630,970, Cl. 405-224.000.

Garrett Corporation, The: *See—*
McCarty, Frederick B., 4,631,435, Cl. 310-156.000.

Mock, Edward A., 4,631,004, Cl. 417-189.000.
Ruckle, Duane L.; and Millan, Ponciano P., Jr., 4,631,092, Cl. 148-3.000.

Gas Research Institute: *See—*
Westra, Leonard F.; Woodroffe, Jaime A.; and Stickler, David B., 4,631,080, Cl. 65-134.000.

Gashet, Gerald: *See—*
Guery, Jean-Pierre; Gashet, Gerald; Olifant, Jacques; and Plumeret, Raymond, 4,631,507, Cl. 335-27.000.

Gasparaitis, Bernard V.: *See—*
Abdala, Julio, Jr.; and Gasparaitis, Bernard V., 4,630,895, Cl. 350-345.000.

Gasper, Kenneth E., to Olin Corporation. Chemical process monitor. 4,631,530, Cl. 340-679.000.

Gatof, Norman: *See—*
Connelly, Lynette M.; and Gatof, Norman, 4,630,452, Cl. 63-12.000.

Gaudiau, Gaston, to Societe Mte. Elastic supported mechanism. 4,630,807, Cl. 267-140.100.

Gaul, John H., Jr.: *See—*
Bartos, Donald M.; and Gaul, John H., Jr., 4,631,260, Cl. 501-88.000.

Gawron-Burke, Mary C.: *See—*
Clewell, Don B.; and Gawron-Burke, Mary C., 4,631,259, Cl. 435-172.300.

Gazzolo, Christian: *See—*
Cinquin, Jean P.; Gazzolo, Christian; and Pisciotta, Michel, 4,631,508, Cl. 335-142.000.

GEA Wiegand GmbH: *See—*
Findling, Josef, 4,630,776, Cl. 239-553.300.

Gebauer, Helmut; and Regiert, Marlies, to Consortium fur elektrochemische Industrie GmbH. Alpha-tertiary dimethylacetals and their use as fragrant substances. 4,631,146, Cl. 252-522.00R.

Geier, Erich: *See—*
Felsner, Fritz; and Geier, Erich, 4,631,638, Cl. 361-415.000.

Geipel, Henry J., Jr.; and Pan, Pai-Hung, to International Business Machines Corporation. Growth of bird's beak free semi-rox. 4,631,219, Cl. 428-131.000.

Geis, Charles G.: *See—*
Neuner, James A.; Boomgaard, Dirk J.; Wilbur, Susan A.; and Geis, Charles G., 4,631,537, Cl. 340-870.170.

Gelfand, David H., to Cetus Corporation. Stable high copy number plasmids. 4,631,257, Cl. 435-68.000.

General Company Limited: *See—*
Ikawa, Osamu; and Yamahata, Takashi, 4,631,232, Cl. 428-413.000.

General Electric Company: *See—*
Beers, William W.; and Parham, Thomas G., 4,631,144, Cl. 252-301.40R.
Fulkerson, Emmet M., 4,630,927, Cl. 356-372.000.
Germer, Warren R.; and Balch, Richard A., 4,631,476, Cl. 324-103.00R.
Howell, Edward K., 4,631,621, Cl. 361-13.000.
Howell, Edward K., 4,631,622, Cl. 361-45.000.
Kumpitsch, Robert C.; Retersdorf, James P.; and Lewis, Charles W., 4,630,881, Cl. 339-176.00R.
Miller, Steven A., 4,631,013, Cl. 425-7.000.
Mueller, Otward M.; and Edelstein, William A., 4,631,495, Cl. 330-310.000.
Oliver, David W., 4,631,742, Cl. 378-113.000.
Peters, Philip H., Jr., 4,631,449, Cl. 315-205.000.
Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., 4,631,634, Cl. 361-358.000.
Stokes, Vijay K., 4,631,433, Cl. 310-89.000.
Thomas, Charles E.; Lee, Minyoung; Bedard, James F.; Hayashi, Steven R.; and Yerazunis, William S., 4,631,683, Cl. 364-474.000.
Torossian, Kevork A.; Markovitz, Mark; and Cox, Frederick E., 4,631,230, Cl. 428-412.000.
Webb, Jimmy L.; and Olsen, Cathryn E., 4,631,346, Cl. 556-420.000.

General Motors Corporation: *See—*
Armstrong, Donald J.; Giacomazzi, Roy A.; and Niepoth, George W., 4,630,749, Cl. 220-86.00R.
Faust, Daniel P., 4,630,716, Cl. 188-371.000.
Johnston, Gary L.; and Lambert, Harvey J., 4,630,721, Cl. 192-58.00B.
Peter, David A., 4,631,685, Cl. 364-476.000.

General Research of Electronics, Inc.: *See—*
Imazeki, Kazuyoshi; and Yokoyama, Nobuaki, 4,631,377, Cl. 200-314.000.

General Screw Products Company: *See—*
Nimberger, Spencer M., 4,630,629, Cl. 137-15.000.

General Signal Corporation: *See—*
Frielinghaus, Klaus H., 4,630,792, Cl. 246-369.000.

Genicom Corporation: *See—*
Karns, Ward L., 4,630,948, Cl. 400-196.100.

Gennetten, Edward W.; and Gomez, Duane A., to United States of America, Navy. Digital raster timing encoder/decoder. 4,631,586, Cl. 358-148.000.

Gentry, James C. Food unit making and packaging apparatus and method. 4,630,426, Cl. 53-428.000.

George, John B., to RCA Corporation. Feedback display driver stage. 4,631,595, Cl. 358-243.000.

George, Stephen; and George, Thomas, to Subtex, Inc. High temperature, molten metal resistant fabric composition. 4,631,224, Cl. 428-246.000.

George, Thomas: *See*—
George, Stephen; and George, Thomas, 4,631,224, Cl. 428-246.000.

Georgiev, Vassil S.; and Mullen, George B., to Pennwalt Corporation. 1,4-oxazinone derivatives. 4,631,340, Cl. 544-171.000.

Gerard, Jean-Louis: *See*—
Romeas, Rene ; Bricot, Claude; and Gerard, Jean-Louis, 4,631,713, Cl. 369-54.000.

Gerling, Paul, to Glyco-Maschinenbau GmbH. Bearing housing. 4,630,945, Cl. 384-320.000.

Germanton, Damon; and Weiss, Donald. Low cost thermocouple apparatus and methods for fabricating the same. 4,631,350, Cl. 136-225.000.

Germer, Warren R.; and Balch, Richard A., to General Electric Company. Memory programmer interface for electronic demand register. 4,631,476, Cl. 324-103.00R.

Getzlaff, Klaus J.: *See*—
Chilinski, Herbert; Getzlaff, Klaus J.; Hajdu, Johann; and Raeth, Franz J., 4,631,663, Cl. 364-200.000.

Geven, Willem J. A., to U.S. Philips Corporation. System for controlling the speed of an electric motor. 4,631,462, Cl. 318-318.000.

GFS Manufacturing Company, Inc.: *See*—
Sylvester, Robert D., Jr.; Horn, Paul C.; and Bober, Vincent J., 4,631,511, Cl. 336-180.000.

Giacomazzi, Roy A.: *See*—
Armstrong, Donald J.; Giacomazzi, Roy A.; and Niepoth, George W., 4,630,749, Cl. 220-86.00R.

Gibson, David: *See*—
Ahmed, Israr; Adams, Gerald E.; Stratford, Ian J.; and Gibson, David, 4,631,289, Cl. 514-397.000.

Gibson, Patrick Howard: *See*—
Kennedy, Conrad P., Jr., 4,630,654, Cl. 141-83.000.

Giebel, Gerhard: *See*—
Bender, Rudolf; Dietrich, Hans-Gerd; and Giebel, Gerhard, 4,630,325, Cl. 12-8.100.

Gilbreath, William E., to Safway Scaffolds Company of Houston. Scaffolding connection and retention device and method. 4,630,956, Cl. 403-49.000.

Gilli, Luigi; and Sartorio, Franco, to Prima Progetti S.p.A. Machine for effecting the transfer of objects in the space between positions having predetermined co-ordinates. 4,630,992, Cl. 414-744.00R.

Gillis, Patrick J., Jr.: *See*—
Keith, Robert C.; VandenBerg, Teunis; Randolph, Marshall C.; Lewis, Thomas B.; and Gillis, Patrick J., Jr., 4,631,126, Cl. 210-108.000.

Gilmore, Michael R.: *See*—
Burk, Ronnie F.; Delfs, Larry M.; Gilmore, Michael R.; and Thompson, Warren L., 4,630,526, Cl. 91-452.000.

Gingerich, Michael E.: *See*—
Taylor, Henry F.; Sigel, George H.; and Gingerich, Michael E., 4,630,883, Cl. 350-96.150.

Ginzburg, Vladimir B.; and Tippins, George W., to Tippins Machinery Company, Inc. Continuous rolling method and apparatus. 4,630,352, Cl. 29-527.700.

Giorgio, Nicholas A.; Krupey, John; and Wilson, Leonard T., to Hoffmann-La Roche Inc. Carcinoembryonic antigen determination. 4,631,254, Cl. 435-7.000.

Giovanini, Donald R.: *See*—
Langman, Richard A.; Giovanini, Donald R.; and Letzig, Michael P., 4,631,160, Cl. 264-62.000.

Girgenti, Russell S.: *See*—
Newton, Robert E.; and Girgenti, Russell S., 4,631,482, Cl. 324-454.000.

Glaser, Siegfried, to Helmut Lingemann GmbH & Co. Connection of two spacer frame profiles as well as process and apparatus for the establishment of the connection. 4,630,959, Cl. 403-266.000.

Gleich, Hermann: *See*—
Koch, Elmar; and Gleich, Hermann, 4,630,516, Cl. 83-530.000.

Glover, Alfred H.: *See*—
Betterton, Joseph T.; and Glover, Alfred H., 4,630,480, Cl. 73-431.000.

Glucksman, Dov Z., to Environmental Fragrance Technologies, Ltd. Aroma generating apparatus with electrical heating element. 4,631,387, Cl. 219-272.000.

Glyco-Maschinenbau GmbH: *See*—
Gerling, Paul, 4,630,945, Cl. 384-320.000.

GMF Robotics Corporation: *See*—
Bambousek, Gerald J.; Bartlett, Donald S.; and Schmidt, Thomas D., 4,630,567, Cl. 118-323.000.

Godfrey, Richard H.: *See*—
D'Amato, Ralph J.; and Godfrey, Richard H., 4,631,439, Cl. 313-402.000.

Goertzel, Gerald: *See*—
Anderson, Karen L.; Mintzer, Frederick C.; and Goertzel, Gerald, 4,631,751, Cl. 382-47.000.

Goetzman, Robert G. Dual stage combustion furnace. 4,630,553, Cl. 110-214.000.

Gohl, Pierre, to La Telemecanique Electrique. DC power control circuit with status reporting and protection against overloads and short circuits. 4,631,623, Cl. 361-86.000.

Goins, Dixie E.; Holmes, Silas W.; and Burt, Edward A., to Ethyl Corporation. Heterogeneous catalyst process. 4,631,349, Cl. 568-789.000.

Gokel, George W.; and Echegoyen, Luis, to W. R. Grace & Co. Reversible, electrochemically-switched lariat ethers. 4,631,119, Cl. 204-59.00R.

Goldberg, Michael L.: *See*—
Null, Robert A.; Laughlin, Lonnie C.; and Goldberg, Michael L., 4,631,073, Cl. 55-18.000.

Golick, Leonard R.: *See*—
Cavada, David R.; and Golick, Leonard R., 4,630,410, Cl. 51-410.000.

Gomez, Duane A.: *See*—
Gennetten, Edward W.; and Gomez, Duane A., 4,631,586, Cl. 358-148.000.

Gonzalez, Jeffrey M.: *See*—
Ferri, John L.; Fulkerson, William C.; Newman, Ray L.; and Gonzalez, Jeffrey M., 4,631,022, Cl. 431-90.000.

Goodchild, Graham H.: *See*—
Crossley, Peter W.; Fellerman, Bernard F.; and Goodchild, Graham H., 4,631,390, Cl. 219-449.000.

Goode, Sidney H., to American Hoechst Corporation. Automatic staple fiber sampler. 4,630,492, Cl. 73-863.820.

Goodfellow, Robert D. Rotary cutter assembly. 4,630,693, Cl. 175-366.000.

Goodman, Howard, to English China Clays Lovering Pochin & Co. Ltd. Method for improving the dispersibility of organoclays. 4,631,091, Cl. 106-308.00N.

Goodwin, Frank E.; Law, Hsiang-Yi D.; Morrison, Charles B.; and Figueroa, Luis, to TRW Inc. Semiconductor laser structure. 4,631,729, Cl. 372-44.000.

Goossens, John: *See*—
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Uytterhoeven, Herman; de Winter, Walter; Hoffarth, Gunther; and Richter, Wolfgang, 4,631,243, Cl. 430-114.000.

Gornowicz, Gerald A.; and Lee, Chi-Long, to Dow Corning Corporation. Moisture resistant polyurethanes derived from non-aromatic diisocyanates. 4,631,329, Cl. 528-28.000.

Goto, Tsukasa: *See*—
Mizuno, Toru; Nanba, Sinzi; Matsui, Kazuma; and Goto, Tsukasa, 4,630,484, Cl. 73-861.220.

Gould, Harry J. Conductive housing and biasing system for microwave integrated circuits. 4,631,494, Cl. 330-286.000.

Goulter, Victor H.: *See*—
Pressman, David; and Goulter, Victor H., 4,630,367, Cl. 30-279.00R.

Grabbe, Dimitry: *See*—
Korsunsky, Iosif; and Grabbe, Dimitry, 4,630,875, Cl. 339-17.0CF.

Graber, Charles D.: *See*—
Kendall, Roger V.; and Graber, Charles D., 4,631,189, Cl. 424-85.000.

Graf, Paul: *See*—
Werner, Hans; Knothe, Frank; Graf, Paul; Wallentowitz, Henning; Keller, Hans-Hermann; and Kist, Alfred, 4,630,803, Cl. 267-8.00R.

Graham, Andrew J. Line trimmer shield. 4,630,371, Cl. 30-347.000.

Graham, Dennis P.: *See*—
Peeters Weem, Jan A.; Krueger, David E.; and Graham, Dennis P., 4,630,856, Cl. 294-81.530.

Graham Magnetics Inc.: *See*—
Haga, Hirokazu, 4,631,479, Cl. 324-212.000.

Graham, Stephen L.; Plunkett, David O.; and Lacey, Robert S., to Dow Chemical Company, The. Adhesive and coating composition. 4,631,308, Cl. 524-272.000.

Grant, Richard W.; and Sciulli, Ronald D., to Atecs Corporation. Adjustable mast step. 4,630,562, Cl. 114-39.000.

Grant, Timothy L. Video game control box holder. 4,630,823, Cl. 273-148.00B.

Gray, George W.: *See*—
Andrews, Beatrice M.; Carr, Neil; Gray, George W.; and Hogg, Christine, 4,630,897, Cl. 350-350.00R.

Greco, Mark, to Schwinn Bicycle Company. Flat cross bar for freestyle bicycle handlebar. 4,630,502, Cl. 74-551.100.

Green, George R. J.: *See*—
Brugliera, Vito; Green, George R. J.; and Long, Michael E., 4,631,601, Cl. 358-335.000.

Green, Sidney J.: *See*—
Jones, Arfon H.; and Green, Sidney J., 4,630,868, Cl. 299-4.000.

Greenfield, Herbert: *See*—
Revelli, Anthony J.; and Greenfield, Herbert, 4,630,932, Cl. 366-279.000.

Greenwald, Larry H., to Aero-Vision Systems, Inc. Video game apparatus integral with airplane passenger seat tray. 4,630,821, Cl. 273-85.00G.

Greenway, John M., to Kendall Company, The. Wound dressing. 4,630,603, Cl. 128-156.000.

Gremillion, Ernest J. Barbecue grill with fire retarding screen. 4,630,593, Cl. 126-25.00R.

Griffee, Les V.: *See*—
Dumas, Ted A.; and Griffee, Les V., 4,631,546, Cl. 343-833.000.

Griggs, Jerald A.: *See*—
Tung, Lu H.; and Griggs, Jerald A., 4,631,313, Cl. 525-250.000.
Tung, Lu H.; and Griggs, Jerald A., 4,631,314, Cl. 525-314.000.

Grimes, Dwight W., to International Business Machines Corporation. Communication interface connecting binary logic unit through a trinary logic transmission channel. 4,631,428, Cl. 307-475.000.

Grimm, Hermann: *See*—
Schmidt, Manfred; Trube, Hans; and Grimm, Hermann, 4,630,327, Cl. 15-250.210.

Grimsley, Richard L., to Cincinnati Microwave, Inc. Police radar warning receiver with mute function. 4,631,542, Cl. 342-20.000.

Groos, Heinrich: *See*—
Dommer, Erich; and Groos, Heinrich, 4,631,237, Cl. 428-621.000.
Gross, Helmut, to Motoren-und Turbinen Union Muchen GmbH. Apparatus for axially and circumferentially locking stationary casing components of turbomachines. 4,630,994, Cl. 415-190.000.
Grossiord, Claude, to S. T. DuPont. Watches or the like equipped with a display device of the date type. 4,630,937, Cl. 368-223.000.
Grossman, Craig B.; Schwartz, Mark A.; and Hammer, Stanley S., to Video Dynamics, Inc. Head cleaning cassette for a video cassette recorder. 4,631,615, Cl. 360-128.000.
Grosso, Elaine C.: *See*—
Bergeron, Lawrence E.; Daly, Daniel F.; and Grosso, Elaine C., 4,631,746, Cl. 381-35.000.
Grothe, Steven P., to Sperry Corporation. Raster display generator for hybrid display system. 4,631,532, Cl. 340-703.000.
Grothues-Spork, Hermann. Stern fin for single-prop ship. 4,631,036, Cl. 440-66.000.
Grotkasten, Klaus: *See*—
Drewel, Gunter; Enoch, Horst; and Grotkasten, Klaus, 4,631,014, Cl. 425-34.00R.
Gruhler, Siegfried: *See*—
Klingler, Otto; and Gruhler, Siegfried, 4,630,928, Cl. 356-374.000.
Grumman Aerospace Corporation: *See*—
Chapman, Malcolm R., 4,630,791, Cl. 244-173.000.
Grunberg, Robert M.; and Dixon, Michael. Electrical connector. 4,630,876, Cl. 339-48.000.
Grunig Administration: *See*—
Grunig, Dieter, 4,631,357, Cl. 379-40.000.
Grunig, Dieter, to Grunig Administration. Method of and device for monitoring a plurality of automatic selling machines. 4,631,357, Cl. 379-40.000.
GTE Communication Systems Corp.: *See*—
van Husen, Hendrik, 4,631,655, Cl. 363-50.000.
GTE Products Corporation: *See*—
Bergin, John A.; and Cangiano, Frank, 4,631,651, Cl. 362-267.000.
English, George J.; Gagnon, Peter R.; and Leadvaro, Stephen J., 4,631,446, Cl. 313-634.000.
Ferri, John L.; Fulkerson, William C.; Newman, Ray L.; and Gonzalez, Jeffrey M., 4,631,022, Cl. 431-90.000.
Mizuhara, Howard, 4,630,767, Cl. 228-122.000.
Guery, Jean-Pierre; Gashet, Gerald; Olifant, Jacques; and Plumeret, Raymond, to La Telemecanique Electrique. Variable composition switching device. 4,631,507, Cl. 335-27.000.
Guile, Peter J. D.: *See*—
Gunderson, Richard H.; Gardner, Terry N.; and Guile, Peter J. D., 4,630,970, Cl. 405-224.000.
Guillaume, Paul; Kayser, Didier; and Propice, Jean, to L'Air Liquide. Process for incinerating waste products at a controlled temperature. 4,630,555, Cl. 110-346.000.
Guinnip, Charles L.: *See*—
Keiser, Terry L.; and Guinnip, Charles L., 4,630,978, Cl. 408-159.000.
Gulis, Nickolas S.: *See*—
Brombal, David S.; Bunner, Charles B. D.; Gulis, Nickolas S.; and Luszczek, John P., 4,631,641, Cl. 361-424.000.
Gulliver, Barron J., to Harter Corporation. Electrostatic dissipative chair. 4,630,867, Cl. 297-452.000.
Gunderson, Richard H.; Gardner, Terry N.; and Guile, Peter J. D., to Exxon Production Research Co. Buoyancy system for submerged structural member. 4,630,970, Cl. 405-224.000.
Guntert, Josef; and Hafele, Walter, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,630,586, Cl. 123-500.000.
Guyer, Thomas L.; and Franz, Robert M., to Upjohn Company, The. Polymeric material as a disintegrant in a compressed tablet. 4,631,305, Cl. 523-400.000.
Gym Bee Enterprises, Inc.: *See*—
Buckley, James F., 4,630,817, Cl. 272-73.000.
H. L. Bouton Company, Inc.: *See*—
Sagemuehl, Hans W.; and Duffie, Kenneth G., 4,630,321, Cl. 2-426.000.
Haas, Laura M.; and Lindsay, Bruce G., to International Business Machines Corporation. Method for refreshing multicolumn tables in a relational data base using minimal information. 4,631,673, Cl. 364-300.000.
Haavisto, John R., to Northrop Corporation. Multichannel optical wave guide resonator. 4,630,885, Cl. 350-96.150.
Haberrecker, Klaus, to Siemens Aktiengesellschaft. X-ray tube. 4,631,744, Cl. 378-138.000.
Habich, Dieter: *See*—
Hartwig, Wolfgang; Habich, Dieter; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,631,275, Cl. 514-210.000.
Habison, Georg: *See*—
Redl, Heinz; and Habison, Georg, 4,631,055, Cl. 604-82.000.
Hadary, Joseph. Toothpick holder. 4,630,623, Cl. 132-89.000.
Hafele, Walter: *See*—
Guntert, Josef; and Hafele, Walter, 4,630,586, Cl. 123-500.000.
Hafner, Otmar: *See*—
Dietz, Erwin; Munkel, Albert; Hafner, Otmar; Rieper, Wolfgang; and Kroh, Adolf, 4,631,330, Cl. 528-49.000.
Hafner, V. Walter; Hahn, Ron T.; and Marshall, Keith D., to Acorn Engineering Company. Rotating cap, screen and mounting means for protecting air metering valve. 4,630,638, Cl. 137-381.000.
Hafner, V. Walter; Hahn, Ron T.; Marshall, Keith D.; and Sally, Theodore J., to Acorn Engineering Company. Dual operated metering valve connected to both a hand operated push button and a foot operated push button. 4,630,644, Cl. 137-624.110.
Haga, Hirokazu, to Graham Magnetics Inc. Error locator for high-speed inspection of magnetic tape. 4,631,479, Cl. 324-212.000.
Hagemeyer, Bruce A., to Rolscreen Company. Door. 4,630,420, Cl. 52-313.000.
Hagen, Gary P., to Standard Oil Company (Indiana). Catalyst and process for preparation of alpha, beta-unsaturated acids. 4,631,264, Cl. 502-243.000.
Haggett, Irving C., to Yardney Corporation. Machine with automatic finger safety guard. 4,631,383, Cl. 219-78.010.
Hagii, Hidehiko: *See*—
Kobayashi, Michio; Yoshida, Masato; Sawada, Hideo; Hagii, Hidehiko; and Aoshima, Kazuyoshi, 4,631,151, Cl. 260-408.000.
Hahlganss, Gunther: *See*—
Angermuller, Helmut; and Hahlganss, Gunther, 4,631,678, Cl. 364-424.000.
Hahn, Ron T.: *See*—
Hafner, V. Walter; Hahn, Ron T.; and Marshall, Keith D., 4,630,638, Cl. 137-381.000.
Hafner, V. Walter; Hahn, Ron T.; Marshall, Keith D.; and Sally, Theodore J., 4,630,644, Cl. 137-624.110.
Haino, Kozo: *See*—
Emoto, Kazuhiro; Haino, Kozo; and Itoh, Akira, 4,631,242, Cl. 430-58.000.
Hajdu, Johann: *See*—
Chilinski, Herbert; Getzlaff, Klaus J.; Hajdu, Johann; and Raeth, Franz J., 4,631,663, Cl. 364-200.000.
Halcon SD Group, Inc., The: *See*—
Rizkalla, Nabil, 4,631,348, Cl. 562-607.000.
Haldor Topsoe A/S: *See*—
Tottrup, Peter B.; and Rostrup-Nielsen, Jens R., 4,631,182, Cl. 423-652.000.
Hales, Michael G.: *See*—
Battice, David R.; and Hales, Michael G., 4,631,297, Cl. 521-78.000.
Hales, Patrick; Laurier, Jean-Pierre; and Pradet, Gerard. Emergency container for an accidentally amputated member. 4,630,596, Cl. 128-1.00R.
Hall, Bill R. Economical fountainhead. 4,630,771, Cl. 237-17.000.
Hall, George R.: *See*—
Hall, Robert J.; Hall, George R.; and Cookerly, Jack C., 4,630,517, Cl. 84-1.010.
Hall, James T.; and Peters, John W., to Hughes Aircraft Company. Photochemical vapor deposition process for depositing oxide layers. 4,631,199, Cl. 427-54.100.
Hall, Robert J.; Hall, George R.; and Cookerly, Jack C. Sharing sound-producing channels in an accompaniment-type musical instrument. 4,630,517, Cl. 84-1.010.
Halliburton Company: *See*—
Smith, Harry D., Jr., 4,631,405, Cl. 250-266.000.
Hallman, John: *See*—
Cygnor, John E.; and Hallman, John, 4,631,009, Cl. 418-15.000.
Hamada, Toshikazu, to Matsushita Electric Works, Ltd. Outer cutter assembly for an electric shaver. 4,630,370, Cl. 30-346.510.
Hamaguchi, Hirohiko: *See*—
Kozuma, Jiro; Hamaguchi, Hirohiko; Shibahara, Tetsuya; and Strasser, Joseph P., 4,631,301, Cl. 523-122.000.
Hamaguchi, Toshiaki: *See*—
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,631,717, Cl. 369-276.000.
Hamamatsu Corp.: *See*—
Schiller, Norman H.; and Alfano, Robert R., 4,630,925, Cl. 356-318.000.
Hammarberg, Lars E., to Telefonaktiebolaget LM Ericsson. Method of detecting hazardous line voltages over a two-wire line. 4,631,475, Cl. 324-102.000.
Hammer, Stanley S.: *See*—
Grossman, Craig B.; Schwartz, Mark A.; and Hammer, Stanley S., 4,631,615, Cl. 360-128.000.
Hamon-Industries: *See*—
Bosne, Georges J. P. E., 4,631,213, Cl. 428-53.000.
Han, Youn W., to United States of America, Agriculture. Irradiation alcohol fermentation process. 4,631,258, Cl. 435-99.000.
Hanaoka, Katsumi: *See*—
Arii, Kazuhiro; Yamamoto, Yasuo; Sumida, Nobuyuki; Hanaoka, Katsumi; and Tanaka, Kazuhiro, 4,631,509, Cl. 336-92.000.
Handel, Martin G.; Robida, James E.; and Slusaraki, Ronald S., to Emhart Industries, Inc. Push bar exit device with alarm. 4,631,528, Cl. 340-545.000.
Handy & Harman: *See*—
McDonald, Allen S.; Philp, Charles W.; and Sperakis, Thomas A., 4,631,171, Cl. 420-481.000.
Handy, Roland J., to Xerox Corporation. High dynamic range charge amplifier. 4,631,739, Cl. 377-60.000.
Hanisch, Michael: *See*—
Bauer, Karl; Hanisch, Michael; and Lenk, Erich, 4,630,340, Cl. 28-187.000.
Hanks, James V., to Horton Manufacturing Co., Inc. Coupling clutch/-brake and housing. 4,630,718, Cl. 192-18.00A.
Hans Grohe GmbH & Co. KG: *See*—
Lorch, Werner, 4,630,643, Cl. 137-597.000.
Hansmann, Johann: *See*—
Theurer, Josef; and Hansmann, Johann, 4,630,541, Cl. 104-7.200.

Hanson, Donald L.: *See*—
Woffinden, Gary A.; Amdahl, Gene M.; and Hanson, Donald L., 4,631,660, Cl. 364-200.000.
Hanssler, Gerd: *See*—
Kraatz, Udo; Buchel, Karl H.; Hanssler, Gerd; Brandes, Wilhelm; and Reinecke, Paul, 4,631,288, Cl. 514-340.000.
Hara, Takafumi, to Sharp Kabushiki Kaisha. Ink liquid baffle-regulated reservoir in an ink jet system printer. 4,631,558, Cl. 346-140.00R.
Harada, Hiroshi: *See*—
Kurihara, Mitsuo; Sato, Fumio; Iwasawa, Yoshiyuki; Koibuchi, Nobutaka; and Harada, Hiroshi, 4,631,076, Cl. 55-283.000.
Harada, Takeshi: *See*—
Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hironobu; Omoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, 4,631,106, Cl. 156-345.000.
Haraikawa, Tetsuo: *See*—
Takayama, Toshio; and Haraikawa, Tetsuo, 4,630,706, Cl. 180-273.000.
Harbour, Gary C.: *See*—
Rinehart, Kenneth L., Jr.; Harbour, Gary C.; and Kobayashi, Jun'ichi, 4,631,149, Cl. 540-546.000.
Harder, Hans E.; and Kramer, Hermann, to Howmedica International, Inc. Bone nail for the treatment of fractures. 4,630,601, Cl. 128-92.0YZ.
Hargreaves, Brian: *See*—
Baker, Ralph; Smith, Eric T.; Dickinson, Vaughan T.; McKenzie, Noel C.; and Hargreaves, Brian, 4,631,209, Cl. 427-392.000.
Harper, Bruce; and Kemp, Horace N., to Xidex Corporation. Method and system for folding floppy disk envelopes. 4,630,427, Cl. 53-460.000.
Harper House, Inc.: *See*—
Willat, Boyd, 4,630,843, Cl. 281-30.000.
Harris Corporation: *See*—
Andrews, D. Marshall, 4,631,636, Cl. 361-385.000.
Snell, James L., 4,631,486, Cl. 329-50.000.
Harris, Craig W.; Jevons, Lyle O., Jr.; and Loskorn, Richard A., to Burroughs Corporation. Data transfer network for variable protocol management. 4,631,666, Cl. 364-200.000.
Harris, Donald L., to Cordis Corporation. Ventricular amniotic shunt and introducer system. 4,631,051, Cl. 604-9.000.
Harris, Jeffrey T.: *See*—
Stutler, Richard A.; and Harris, Jeffrey T., 4,631,662, Cl. 364-200.000.
Harry, John E., to Loughborough Consultants Limited. Apparatus and method for generating a plurality of electric discharges. 4,631,452, Cl. 315-334.000.
Harsanyi, Jozsef; Pinter, Janos; and Suri, Alajos, to Magyar Aluminiumipari Troszt. Process and apparatus for the mixing of slurries. 4,630,931, Cl. 366-107.000.
Harshaw/Filtrol: *See*—
Sparacia, Frank M.; and Wimer, Oley D., 4,631,409, Cl. 250-361.00R.
Harter Corporation: *See*—
Gulliver, Barron J., 4,630,867, Cl. 297-452.000.
Hartman, Russell D.; and Dougherty, Edward M., to Scaletron, Inc. Strain gauge scale. 4,630,697, Cl. 177-211.000.
Hartmannsgruber, Max; von Ronai-Horvath, Michael; Seebo, Kurt; and Schoenung, Bernhard, to SKF Textilmaschinen-Komponenten GmbH. Roving blocking mechanism on draw frames of spinning machines. 4,630,434, Cl. 57-87.000.
Hartwig, Wolfgang; Habich, Dieter; Metzger, Karl G.; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. 1-Oxadethiacephalosporin derivatives and antibacterial use thereof. 4,631,275, Cl. 514-210.000.
Harvey Hubbell Incorporated: *See*—
Boteler, William C., 4,631,354, Cl. 174-66.000.
Harville, Cathy L.: *See*—
Winyall, Milton E.; and Harville, Cathy L., 4,631,184, Cl. 424-49.000.
Hase, Takashi; Yoshida, Hidemi; Suzuki, Hideo; and Hayakawa, Morio, to Kasei Optonix, Ltd. Monochrome display cathode ray tube with long after glow phosphors. 4,631,445, Cl. 313-467.000.
Hasegawa, Hiroaki, to Fukuvi Chemical Industry Co., Ltd. Transparent electromagnetic wave shielding material. 4,631,214, Cl. 428-68.000.
Hashiguchi, Makoto; and Fukutomi, Yohji, to Honda Giken Kogyo K.K. Exhaust gas recirculation method for internal combustion engines. 4,630,589, Cl. 123-571.000.
Hashimoto, Kunio, to Okazaki, Haruo; and Japan Pipe Conveyor Co., Ltd. Tubular belt conveyor and a belt rolling up means of the same. 4,630,726, Cl. 198-819.000.
Hashizume, Kenji; Shiba, Haruo; and Okamura, Masatoshi, to TDK Corporation. Magnetic tape cassette having improved reel locking means. 4,631,619, Cl. 360-132.000.
Hasley, Lloyd A.: *See*—
Franklin, Andrew D.; Hasley, Lloyd A.; and Smith, James E., 4,631,534, Cl. 340-825.500.
Hassler, Joachim: *See*—
Forker, Dieter; Hassler, Joachim; Lau, Bernhard; and Schmidt, Rolf, 4,630,909, Cl. 354-1.000.
Hasty, Robert: *See*—
Potter, Clinton; and Hasty, Robert, 4,631,365, Cl. 379-167.000.
Hata, Akio: *See*—
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,631,717, Cl. 369-276.000.
Hatamura, Koichi; and Hiraoka, Tetsuo, to Mazda Motor Corporation. Intake system for multicylinder engine. 4,630,575, Cl. 123-52.00M.
Hatton, Bruce M., to Eaton Corporation. Low viscous drag knock sensor. 4,630,465, Cl. 73-35.000.
Hattori, Kiyoshi: *See*—
Fukuyama, Hiroomi; Hattori, Kiyoshi; and Nakashima, Yoshihiro, 4,631,465, Cl. 318-565.000.
Hattori, Yoshiyuki: *See*—
Imoto, Yuzo; Wakata, Hideo; Takei, Toshihiro; Hattori, Yoshiyuki; and Nomura, Yoshihisa, 4,630,871, Cl. 303-113.000.
Hauni-Werke Korber & Co. KG.: *See*—
Berlin, Herbert, 4,630,466, Cl. 73-38.000.
Hauschildt, Klaus-Robert: *See*—
Markert, Helmut; Hauschildt, Klaus-Robert; Rogler, Wolfgang; and Kretzschmar, Klaus, 4,631,306, Cl. 523-457.000.
Havens, Joseph H.: *See*—
Arntsen, Tom D.; Embree, Milton L.; Havens, Joseph H.; and Toumani, Rouben, 4,631,362, Cl. 379-384.000.
Hawe-Neos Dental Dr. H. von Weissenfluh S.A.: *See*—
von Weissenfluh, Beat, 4,631,030, Cl. 433-149.000.
Hawke Cable Glands Limited: *See*—
Twist, Michael; and Mundy, Paul, 4,630,848, Cl. 285-308.000.
Haworth, Inc.: *See*—
Lapins, Daniel W.; and Szymanski, Richard, 4,630,416, Cl. 52-239.000.
Hay, Robert A., II, to Dow Chemical Company, The. Film casting apparatus including heat transfer roll. 4,631,016, Cl. 425-224.000.
Hayakawa, Morio: *See*—
Hase, Takashi; Yoshida, Hidemi; Suzuki, Hideo; and Hayakawa, Morio, 4,631,445, Cl. 313-467.000.
Hayami, Ryozo: *See*—
Ebata, Yoshihiro; Kose, Saburo; and Hayami, Ryozo, 4,631,099, Cl. 156-89.000.
Hayashi, Chikara, to Research Development Corporation of Japan. Process for removing covering film and apparatus therefor. 4,631,250, Cl. 430-329.000.
Hayashi Electric Co., Ltd.: *See*—
Uchida, Rokuroh; Nagasaki, Katsuhiko; Miyake, Yasunori; Ohno, Michio; Takeichi, Hitoshi; and Matsumoto, Hiroji, 4,630,612, Cl. 128-660.000.
Hayashi, Kiyoshi: *See*—
Akita, Yoshisuke; Tenmyo, Ichiro; Hayashi, Kiyoshi; Kihara, Kazuyuki; and Mito, Akio, 4,630,639, Cl. 137-486.000.
Hayashi, Kunihal: *See*—
Tanuma, Jiro; Uchida, Takao; and Hayashi, Kunihal, 4,631,457, Cl. 318-254.000.
Hayashi, Mikio: *See*—
Mizutani, Seiki; Hayashi, Mikio; and Ikeda, Kazuaki, 4,630,946, Cl. 400-121.000.
Hayashi, Shun-ichi: *See*—
Tsumura, Akio; Hayashi, Shun-ichi; Miyaake, Chiharu; Oouchi, Kazuo; and Yamamura, Yutaka, 4,631,110, Cl. 156-584.000.
Hayashi, Steven R.: *See*—
Thomas, Charles E.; Lee, Minyoung; Bedard, James F.; Hayashi, Steven R.; and Yerazunis, William S., 4,631,683, Cl. 364-474.000.
Hayashi, Torahiko, to Rheon Automatic Machinery Co., Ltd. Apparatus for rolling plastic dough. 4,631,017, Cl. 425-335.000.
Hayashi, Torahiko, to Rheon Automatic Machinery Co., Ltd. Apparatus for quantifying the flow rate of dough. 4,631,021, Cl. 425-140.000.
Hayashibara, Ken: *See*—
Masaki, Kazumi, 4,630,996, Cl. 416-16.000.
Haygreen, John G., to University of Minnesota, Regents of the. Method and apparatus for de-watering biomass materials in a compression drying process. 4,630,535, Cl. 100-127.000.
Hayn, John, II; and Schabowski, John, to Texas Instruments Incorporated. Memory interface with automatic delay state. 4,631,659, Cl. 364-200.000.
Hazeltine Corporation: *See*—
St. John, Karl M., 4,631,576, Cl. 358-65.000.
Heath Company: *See*—
Rapaich, Mark, 4,631,749, Cl. 381-103.000.
Hecht, Joachim; and Rudat, Gerhard, to Mannesmann AG. Actuating mechanism in overhead rail equipment. 4,630,544, Cl. 105-130.000.
Heck, Reinhard, to Kraftwerk Union Aktiengesellschaft. Nuclear power station with a containment. 4,631,164, Cl. 376-300.000.
Hecker, Edward P.: *See*—
Boyle, William B.; Candelaria, Rodolfo, Jr.; and Hecker, Edward P., 4,630,344, Cl. 29-149.50R.
Heikkila, Heikki, to Suomen Sokeri Oy. Production of pure sugars and lignosulfonates from sulfite spent liquor. 4,631,129, Cl. 210-635.000.
Hein-Werner Corporation: *See*—
Donahue, Robert L., 4,630,380, Cl. 33-288.000.
Heine, Franz; and Ruttershoff, Heinz-Joachim, to O&K Orenstein & Koppel Aktiengesellschaft. Apparatus for the remote-controlled connecting or separating of two coupling parts. 4,630,878, Cl. 339-75.00M.
Heintzmann, Peter; Koppers, Manfred; Bohnes, Karlheinz; and Domanski, Lothar, to Bochumer Eisenhuette Heintzmann GmbH & Co. KG. Peripherally flexible prop arch for mining tracks, tunnels or the like. 4,630,973, Cl. 405-288.000.
Hellerhoff, Josef; Bunse, Peter; and te Beest, Hans, to A. Friedr. Flender GmbH & Co. KG. Method for assembling two-way transmission gears with power distribution. 4,630,349, Cl. 29-434.000.
Hellwig, Horst. Traffic intersection. 4,630,961, Cl. 404-1.000.

Helminiak, Thaddeus E.: *See*—
Hwang, Wen-Fang; Wiff, Donald R.; and Helminiak, Thaddeus E., 4,631,318, Cl. 525-432.000.
Helmut Lingemann GmbH & Co.: *See*—
Glaser, Siegfried, 4,630,959, Cl. 403-266.000.
Helweg, Lionel C.: *See*—
Fisher, Glen W.; Helweg, Lionel C.; and Jones, Rick S., 4,630,489, Cl. 73-861.870.
Henschel, Reed E. Foldable stool. 4,630,861, Cl. 297-44.000.
Hepworth, Ian C., to British Nuclear Fuels plc. Flow control apparatus. 4,630,628, Cl. 137-12.000.
Herbst, Thomas; and Schitzler, Lorenz, to Dyckerhoff & Widmann Aktiengesellschaft. Apparatus for anchoring rock and the like. 4,630,971, Cl. 405-260.000.
Hercules Incorporated: *See*—
Tise, Frank P., 4,631,247, Cl. 430-281.000.
Herrick, Robert A.: *See*—
Rapp, Charles F.; and Herrick, Robert A., 4,631,178, Cl. 423-210.000.
Herrmann, Dietrich E.; and Abraham, Detlev, to Otis Elevator Company. Escalator passenger flow control. 4,631,467, Cl. 318-798.000.
Hewlett-Packard Company: *See*—
Cutler, Gregory M., 4,631,498, Cl. 331-9.000.
Opfer, James E.; and Natarajan, Bangalore R., 4,631,202, Cl. 427-131.000.
Trutna, William R., Jr., 4,631,416, Cl. 250-548.000.
Hicks, Darrell D., to Interez, Inc. Process for preparing low viscosity UV curable polyacrylates. 4,631,300, Cl. 522-100.000.
Hicks, John W., Jr., to Polaroid Corporation. Polarization locked optical fiber and method. 4,630,889, Cl. 350-96.300.
Hietkamp, Gerrit: *See*—
Sanger, Georg; Hietkamp, Gerrit; and Peschka, Walter, 4,631,096, Cl. 149-1.000.
Higashiizumi, Takao: *See*—
Yamaguchi, Keiki; Higashiizumi, Takao; Shimazaki, Toru; Sano, Shinichi; and Takeuchi, Yasuhito, 4,631,710, Cl. 367-103.000.
Higashiyama, Kazuhiro; and Ishigami, Kazuhiro, to Nissan Motor Co., Ltd. Fuel octane responsive internal combustion engine ignition system. 4,630,584, Cl. 123-425.000.
Higgins, Michael. Fish lure. 4,630,389, Cl. 43-42.220.
Higuchi, Masakazu: *See*—
Matsumoto, Mitsuaki; Furuyama, Masatosi; Tomioka, Tadao; Sunago, Hirofumi; and Higuchi, Masakazu, 4,631,181, Cl. 423-449.000.
Hill, Charles C., to Watters, James Virgil. Jogging apparatus. 4,630,816, Cl. 272-70.000.
Hill, John; Turczanski, Henryk; and Coote, Cyril E., to Standex electronics (UK) Limited. Method of making mercury containing reed switches. 4,630,359, Cl. 29-602.00R.
Hill, John W.; and Sword, Anthony J., to Microbot, Inc. Control and force-sensing method and apparatus for motors. 4,631,657, Cl. 364-167.000.
Hillenbrand, Hans-Georg: *See*—
von Hagen, Ingo; Hillenbrand, Hans-Georg; and Popperling, Rolf K., 4,631,095, Cl. 148-12.00F.
Hills, Blair H.; and Crispino, Vincent J., to Bofors Nobel, Inc. System and method of particulating 4,4' methylenebis (2-chloroaniline). 4,631,156, Cl. 264-37.000.
Hilti Aktiengesellschaft: *See*—
Durr, Paul, 4,630,512, Cl. 81-475.000.
Hunger, Josef; and Neumaier, Anton, 4,630,836, Cl. 279-19.000.
Hirakawa, Tadashi; Yoshikawa, Kiyomitsu; Yoshioka, Shigenari; and Sasashige, Hiroaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Single facer. 4,631,109, Cl. 156-472.000.
Hirano, Mutsuo; and Tsunoda, Nagatoshi. Device for rhythmically driving an electromechanical vibrator. 4,630,519, Cl. 84-1.030.
Hirano, Yoshinori, to Nissan Motor Co., Ltd. Cooling system for automotive engine or the like. 4,630,574, Cl. 123-41.270.
Hirano, Yoshinori: *See*—
Ogawa, Naoki; Kubozuka, Takao; and Hirano, Yoshinori, 4,630,573, Cl. 123-41.270.
Hiraoka, Tetsuo: *See*—
Hatamura, Koichi; and Hiraoka, Tetsuo, 4,630,575, Cl. 123-52.00M.
Hirose, Toshifumi: *See*—
Isayama, Katsuhiko; Hirose, Toshifumi; Iwahara, Takahisa; and Kawakubo, Fumio, 4,631,322, Cl. 525-480.000.
Hiroshi, Haguchi: *See*—
Shigeo, Iwasaki; and Hiroshi, Haguchi, 4,631,015, Cl. 425-195.000.
Hirt, Edmund; Send, Dietmar; and Diete, Gunter, to Dixie Union Verpackungen GmbH, Firma. Package, for example, for surgical instruments and products. 4,630,729, Cl. 206-363.000.
Hishiki, Hideo; and Kamiyama, Yukio, to Victor Company of Japan, Ltd. Voltage dividing resistor device. 4,631,512, Cl. 338-48.000.
Hitachi Cable, Ltd.: *See*—
Nagatsuma, Kazuyuki; Takagi, Kazumasa; and Matsumura, Hiroyoshi, 4,631,402, Cl. 250-231.00R.
Hitachi, Ltd.: *See*—
Furuichi, Tokinori, 4,631,458, Cl. 318-254.000.
Kawashita, Asayoshi; and Kuniga, Hirofumi, 4,631,671, Cl. 364-200.000.
Kubo, Kanji; and Izumi, Chikahiko, 4,631,668, Cl. 364-200.000.
Masuda, Mitsuhiro; Igarashi, Osamu; and Tokuyama, Keiichi, 4,630,840, Cl. 280-707.000.
Mizumoto, Mamoru; Yamashita, Hisao; Matsuda, Shinpei; and Yamaguchi, Kazuhiko, 4,631,263, Cl. 502-159.000.
Nagatsuma, Kazuyuki; Takagi, Kazumasa; and Matsumura, Hiroyoshi, 4,631,402, Cl. 250-231.00R.
Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hironobu; Omoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, 4,631,106, Cl. 156-345.000.
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Ishitani, Toru: *See*—
Tamura, Hifumi; Shepherd, Clay; Ishitani, Toru; and Umemura, Kaoru, 4,631,448, Cl. 315-111.810.
Ishiyama, Ichiro: *See*—
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Ito, Hideaki: *See*—
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Itoh, Akira: *See*—
Emoto, Kazuhiro; Haino, Kozo; and Itoh, Akira, 4,631,242, Cl. 430-58.000.
ITT Corporation: *See*—
Miller, Robert L., 4,631,361, Cl. 379-351.000.
Ivek Corporation: *See*—
Zeitz, Vernon, 4,631,529, Cl. 340-619.000.
Iwahara, Takahisa: *See*—
Isayama, Katsuhiko; Hirose, Toshifumi; Iwahara, Takahisa; and Kawakubo, Fumio, 4,631,322, Cl. 525-480.000.
Iwai, Tomio; and Matsushita, Yukio, to Sanshin Kogyo Kabushiki Kaisha. Outboard motor with turbo-charger. 4,630,446, Cl. 60-602.000.
Iwamoto, William T., to Decision-Tree Associates, Inc. Multi-well hydrocarbon development system. 4,630,681, Cl. 166-366.000.
Iwasawa, Yoshiyuki: *See*—
Kurihara, Mitsuo; Sato, Fumio; Iwasawa, Yoshiyuki; Koibuchi, Nobutaka; and Harada, Hiroshi, 4,631,076, Cl. 55-283.000.
Iwata, Hideo: *See*—
Kitagawa, Yoshiaki; and Iwata, Hideo, 4,631,102, Cl. 156-210.000.

Izumi, Chikahiko: *See*—
Kubo, Kanji; and Izumi, Chikahiko, 4,631,668, Cl. 364-200.000.
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Masumoto, Mituhiko; Yanada, Shigeo; Izumida, Toshiaki; and Akahori, Kazuyuki, 4,631,334, Cl. 528-202.000.
Izzi, Lewis B., Sr., to Plastic Oddities, Inc. Flush cut handsaws. 4,630,368, Cl. 30-289.000.
J. E. Love Company: *See*—
Love, John E.; Neal, Archie E.; and Libby, Scott, 4,630,432, Cl. 56-220.000.
Jacavanco, Daniel, to United States of America, Air Force. Reflector antenna having sidelobe suppression elements. 4,631,547, Cl. 343-840.000.
Jackson, Charles R.: *See*—
Rellis, Daniel, Jr.; Fosnacht, Donald R.; and Jackson, Charles R., 4,630,801, Cl. 266-216.000.
Jackson, E. Don, to Conmaco, Inc. Control valve for pile driver and method. 4,630,524, Cl. 91-219.000.
Jackson, Norman C., to Standard Products Company, The. Stud attachment method for vehicle molding. 4,631,104, Cl. 156-293.000.
Jacobs, David R.: *See*—
Ladd, James E., Jr.; and Jacobs, David R., 4,630,955, Cl. 401-123.000.
Jacobsen, William F. M.; and Zansky, Zoltan, to Honeywell Inc. Automatic light-intensity control. 4,631,675, Cl. 364-400.000.
Jacquot, Bernard, to Commissariat a l'Energie Atomique. Multicharged ion source with several electron cyclotron resonance zones. 4,631,438, Cl. 313-359.100.
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Hopkins, Allan S., 4,630,499, Cl. 74-473.00R.
Jahnel, Kurt: *See*—
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Jakob, Paul G. Fluid recovery system. 4,630,677, Cl. 166-68.000.
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Steck, Werner; and Jakusch, Helmut, 4,631,140, Cl. 252-62.560.
James, Bobby D.: *See*—
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James Howden & Company Limited: *See*—
De La Harpe, Jean H., 4,630,999, Cl. 416-167.000.
Jansen, Harley W.: *See*—
Dvorak, Robert F.; Jansen, Harley W.; and Zylstra, Henry J., 4,631,624, Cl. 361-89.000.
Janssen Pharmaceutica N.V.: *See*—
Boeckx, Gustaaf M.; Raeymaekers, Alfons H. M.; and Sipido, Victor, 4,631,278, Cl. 514-242.000.
Jansson, Arne: *See*—
Severin, Eric; Jansson, Arne; and Ostman, Kjell, 4,630,734, Cl. 206-461.000.
Janzen, David C.: *See*—
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Japan Pipe Conveyor Co., Ltd.: *See*—
Hashimoto, Kunio, 4,630,726, Cl. 198-819.000.
Japan Steel Works, Ltd., The: *See*—
Ohnishi, Keizo; and Ogawa, Takatoshi, 4,631,170, Cl. 420-455.000.
Japan Storage Battery Company Limited: *See*—
Kawanami, Yoshiharu, 4,631,241, Cl. 429-225.000.
Japan Tobacco & Salt Public Corporation, The: *See*—
Horie, Motonobu; Suzuki, Minoru; and Ogura, Shinji, 4,630,724, Cl. 198-399.000.
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Watanabe, Kainen; Yasuhara, Hiroto; Sugiyama, Toru; Shimizu, Keiji; and Murata, Yoshihiro, 4,630,772, Cl. 238-159.000.
Jebens, Klaus. Dispenser carton for drinking straws with tear-out dispensing opening. 4,630,735, Cl. 206-611.000.
Jefsteel Business Equipment Corp.: *See*—
Levenberg, Nat, 4,630,739, Cl. 211-189.000.
Jelco. Co., Ltd.: *See*—
Nobesawa, Shigeru, 4,631,378, Cl. 200-340.000.
Jellinek, Thomas, to Commonwealth Scientific and Industrial Research Organization. Compositions for the treatment of textile materials. 4,631,226, Cl. 428-270.000.
Jem Imports, Inc.: *See*—
Massaglia, Giovanni, 4,630,822, Cl. 273-118.00A.
Jenekhe, Samson A., to Honeywell Inc. Method of making conducting polymer complexes of N-substituted carbazoles and substituted benzaldehydes. 4,631,323, Cl. 525-509.000.
Jensen, Carl E., to Nordisk Ventilator Co. Axial-flow fan. 4,630,993, Cl. 415-53.00R.
Jensen, Leif H.: *See*—
Petersen, Erling N.; Jensen, Leif H.; Watjen, Frank; and Seidelmann, Dieter, 4,631,285, Cl. 514-292.000.
Jensen, Svend A. K.; Munck, Lars; Sigsgaard, Poul; and Huss, Hans H., to De Forenede Bryggerier A/S. Method for quality control of products from fish, cattle, swine and poultry. 4,631,413, Cl. 250-458.100.
Jevons, Lyle O., Jr.: *See*—
Harris, Craig W.; Jevons, Lyle O., Jr.; and Loskorn, Richard A., 4,631,666, Cl. 364-200.000.
Jewell, Jack L. Etalon optical logic gate apparatus and method. 4,630,898, Cl. 350-354.000.
Johannes Heidenhain GmbH: *See*—
Burkhardt, Horst; Ernst, Alfons; Dangschat, Holmer; and Wogatzke, Horst, 4,631,404, Cl. 250-237.00G.
Johansson, Jan H.; and Sundvall, Nils J., to Telefonaktiebolaget LM Ericsson. Arrangement for supplying current to a subscriber telephone set. 4,631,359, Cl. 379-324.000.
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Sonnentag, Kurt J.; and Steinkamp, Norman A., 4,630,532, Cl. 99-279.000.
Johns, Marshall E.; Strassner, Keith D.; and Braga, Thomas G., to Petrolite Corporation. Corrosion inhibitors. 4,631,138, Cl. 252-8.555.
Johnson, Bruce G.: *See*—
Drescher, Robert D.; Eisenhaure, David B.; Hockney, Richard L.; Johnson, Bruce G.; St. George, Emery, Jr.; and Whipple, David C., 4,631,456, Cl. 318-140.000.
Johnson, Bruce M., to Bend Research, Inc. Production of permeable cellulose triacetate membranes. 4,631,157, Cl. 264-41.000.
Johnson, Dennis, to Pakwa Engineering Ltd. Liquid volume sensor system. 4,630,478, Cl. 73-299.000.
Johnson Fishing, Inc.: *See*—
Menne, Eugene P., 4,631,033, Cl. 440-7.000.
Menne, Eugene P.; Lagerquist, William B.; and Decko, Del P., 4,631,034, Cl. 440-7.000.
Johnson, John: *See*—
Salpekar, Anil M.; and Johnson, John, 4,631,284, Cl. 514-277.000.
Johnson, John L., to Schrader Bellows Inc. Pressure regulator. 4,630,632, Cl. 137-85.000.
Johnson, Robert R., to Energy Conversion Devices, Inc. Electric circuits having repairable circuit lines and method of making the same. 4,630,355, Cl. 29-575.000.
Johnston, Gary L.; and Lambert, Harvey J., to General Motors Corporation. Viscous clutch for engine cooling fan. 4,630,721, Cl. 192-58.00B.
Johnston, James S., to Rosemount Engineering Company Limited. Position measuring apparatus. 4,631,519, Cl. 340-347.00P.
Johnstone Pump Company: *See*—
Wold, Robert E., 4,630,760, Cl. 222-387.000.
Jones, Arfon H.; and Green, Sidney J., to Terra Tek, Inc. Process for solution mining. 4,630,868, Cl. 299-4.000.
Jones, James C., to Owens-Illinois, Inc. Concentrated compositions for coating corrugated board. 4,631,086, Cl. 106-36.000.
Jones, Larry D., to National Starch and Chemical Corporation. Wastewater flocculating agent. 4,631,132, Cl. 210-727.000.
Jones, Reed W., III. Non-polluting non-toxic drilling fluid compositions and method of preparation. 4,631,136, Cl. 252-8.50M.
Jones, Richard I., to Pilkington P.E. Limited. Eyeguards. 4,630,903, Cl. 350-579.000.
Jones, Rick S.: *See*—
Fisher, Glen W.; Helweg, Lionel C.; and Jones, Rick S., 4,630,489, Cl. 73-861.870.
Jones, Robert E.: *See*—
Crane, Dale E.; Jones, Robert E.; Watson, Mathew D.; and White, Alan D., 4,631,727, Cl. 372-33.000.
Jordan, Alfons: *See*—
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Joslyn Mfg. and Supply Co.: *See*—
deSouza, Alwyn A.; and Oertel, Hans W., 4,631,453, Cl. 315-340.000.
Jubinski, Paul, to Western Geophysical Co. of America. Method and apparatus for monitoring optical fiber lapping and polishing. 4,630,884, Cl. 350-96.150.
Juneja, Prem S., to Proctor & Gamble Company, The. Depilatory compositions. 4,631,064, Cl. 8-161.000.
Jung, Eggert: *See*—
Hoffrichter, Ingo; and Jung, Eggert, 4,631,579, Cl. 358-80.000.
Juntgen, Harald: *See*—
Wagener, Heinrich; Kirchhoff, Reinhold; Van Heek, Karl H.; and Juntgen, Harald, 4,630,479, Cl. 73-863.830.
Kabushiki Kaisha Iseki Kaihatsu Koki: *See*—
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Kabushiki Kaisha Kobe Seiko Sho: *See*—
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Kabushiki Kaisha Machida Seisakusho: *See*—
Oku, Toshio, 4,630,649, Cl. 138-122.000.
Kabushiki Kaisha Morita Seisakusho: *See*—
Watanabe, Minoru, 4,630,862, Cl. 297-167.000.
Kabushiki Kaisha Sanyo Seiki Seisakusho: *See*—
Kobayashi, Akira; and Yanagisawa, Fukashi, 4,631,610, Cl. 360-104.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Kubota, Kazuhisa; and Ichikawa, Takafumi, 4,630,501, Cl. 74-484.00R.
Nishimura, Yuji; Mori, Shinji; and Kawaguchi, Teruhiko, 4,630,841, Cl. 280-806.000.
Kabushiki Kaisha Toshiba: *See*—
Aoyama, Shuki, 4,631,379, Cl. 269-10.55F.
Ikawa, Yasuo; Shibata, Tadashi; Urui, Kiyoshi; Miyata, Misao; Kawamura, Masahiko; and Amano, Noboru, 4,631,686, Cl. 364-490.000.
Ishiguro, Minoru; Kaneko, Kouji; and Kondo, Toru, 4,630,916, Cl. 354-418.000.

Kobayashi, Shouzou, 4,631,552, Cl. 346-136.000.
Watanabe, Junji, 4,630,921, Cl. 355-3.0SH.
Watanabe, Toshiyuki; and Yamada, Noboru, 4,630,813, Cl. 271-227.000.
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Kachare, Akaram H.: *See*—
Daud, Taher; and Kachare, Akaram H., 4,631,352, Cl. 136-249.000.

Kagan, Michael. Suspendable display receptacle. 4,630,795, Cl. 248-318.000.

Kaganov, Alan L.: *See*—
Ritter, Thomas A.; Bray, James C.; and Kaganov, Alan L., 4,630,617, Cl. 128-784.000.

Kahlman, Josephus A. H. M.; and Baggen, Constant P. M. J., to U.S. Philips Corporation. Apparatus for furnishing data signals from an optically readable record carrier at the same frequency as the associated subcode signals. 4,631,714, Cl. 369-59.000.

Kaiser, Walter: *See*—
Wolvek, Sidney; Kaiser, Walter; and Kaltenbach, Kenneth, 4,631,059, Cl. 604-280.000.

Kajihara, Seishi: *See*—
Ohmori, Shunji; Takenaka, Hiroyuki; Hozoji, Akira; Kono, Kazunori; Yoshikawa, Kiyomitsu; and Kajihara, Seishi, 4,630,514, Cl. 83-342.000.

Kajima, Takashi: *See*—
Sagawa, Ryuichi; Nagata, Osamu; and Kajima, Takashi, 4,630,588, Cl. 123-506.000.

Kakabaker, Kenneth G., to Durametallic Corporation. Seal arrangement for mill roll. 4,630,458, Cl. 72-237.000.

Kakalec, Robert J.: *See*—
Fouad, Fakhry A.; Kakalec, Robert J.; and Menkes, Henry E., 4,631,471, Cl. 323-306.000.

Kakehi, Yutaka: *See*—
Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hironobu; Omoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, 4,631,106, Cl. 156-345.000.

Kakinuma, Hiroaki; Nishikawa, Satoshi; and Watanabe, Tsukasa, to Oki Electric Industry Co., Ltd. Method of manufacturing thin amorphous silicon film. 4,631,198, Cl. 427-38.000.

Kalka, Josef: *See*—
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Kalmar LMV: *See*—
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Kaltenbach, Kenneth: *See*—
Wolvek, Sidney; Kaiser, Walter; and Kaltenbach, Kenneth, 4,631,059, Cl. 604-280.000.

Kalyanaraman, Palaiyur S., to Rohm & Haas Company. Process for forming thermally stable negative images on surfaces utilizing polyglutarimide polymer in photoresist composition. 4,631,249, Cl. 430-325.000.

Kamiyama, Yukio: *See*—
Hishiki, Hideo; and Kamiyama, Yukio, 4,631,512, Cl. 338-48.000.

Kamprath, Axel; and Ruehr, Volker, to Dr. Ing.h.c.F Porsche Aktiengesellschaft. Temperature resistant tire pressure control device. 4,630,471, Cl. 73-146.500.

Kan, Charles S., to Dow Chemical Company, The. Adhesion of latex coatings to polymeric surfaces. 4,631,233, Cl. 428-420.000.

Kan, Jean-Paul; Biziere, Kathleen; and Wermuth, Camille-Georges, to Sanofi. Pyridazine derivatives having a psychotropic action, and medicaments in which they are present. 4,631,280, Cl. 514-247.000.

Kan, Yuji, to Sanyo Electric Co., Ltd. Waste toner collecting apparatus. 4,630,653, Cl. 141-83.000.

Kanazawa, Tomoyoshi: *See*—
Nishino, Yoshinori; Yamamoto, Masahiko; Uda, Tadayoshi; and Kanazawa, Tomoyoshi, 4,630,846, Cl. 285-21.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
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Maeda, Hirofumi; Watanabe, Kazuyoshi; Akamatsu, Naruhiko; Senda, Kenichi; and Nishioka, Shunichi, 4,631,159, Cl. 264-53.000.
Tawada, Yoshihisa; and Tsuge, Kazunori, 4,631,351, Cl. 136-244.000.

Kaneko, Kouji: *See*—
Ishiguro, Minoru; Kaneko, Kouji; and Kondo, Toru, 4,630,916, Cl. 354-418.000.

Kaneko, Shuzo, to Canon Kabushiki Kaisha. Image forming method. 4,631,559, Cl. 346-160.000.

Kangaroos U.S.A., Inc.: *See*—
Gamm, Robert J., 4,630,383, Cl. 36-136.000.

Kano, Harumi: *See*—
Matsuda, Takeshi; and Kano, Harumi, 4,631,504, Cl. 333-25.000.

Kano, Masafumi; Tanaka, Megumu; Sato, Atsushi; and Kawakami, Shigenobu, to Nippon Petrochemicals Company, Limited. Impregnated capacitor. 4,631,632, Cl. 361-315.000.

Kantrowitz, Adrian; and Freed, Paul S. Dynamic aortic patch for thoracic or abdominal implantation. 4,630,597, Cl. 128-1.00D.

Kao Corporation: *See*—
Matsumoto, Kiyoshi; Fujikura, Yoshiaki; and Nakajima, Motoki, 4,631,147, Cl. 252-522.00R.

Kappeler, Ronald P.; and Hughes, Robert C., to NCR Corporation. Dynamic random access memory refresh control system. 4,631,701, Cl. 364-900.000.

Karashima, Toshiharu: *See*—
Fukunaga, Tokio; Magara, Takuji; Sakabe, Shigekazu; Aramaki, Jun; Karashima, Toshiharu; and Ushida, Minoru, 4,631,382, Cl. 219-69.00R.

Karatsu, Masanori: *See*—
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Karbstein, Peter, to ACO Polymer Products, Inc. Drainage channel. 4,630,966, Cl. 405-118.000.

Karns, Ward L., to Genicom Corporation. Inked ribbon cartridge. 4,630,948, Cl. 400-196.100.

Kartarik, Mark H.: *See*—
Newcome, Thomas W., III; and Kartarik, Mark H., 4,631,358, Cl. 379-45.000.

Kasamatsu, Kiyoshi: *See*—
Yamamoto, Haruyasu; Kasamatsu, Kiyoshi; Okabe, Takayuki; and Mukai, Kunio, 4,631,347, Cl. 260-963.000.

Kase, Masao: *See*—
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Kasei Optonix, Ltd.: *See*—
Hase, Takashi; Yoshida, Hidemi; Suzuki, Hideo; and Hayakawa, Morio, 4,631,445, Cl. 313-467.000.

Kasperkovitz, Wolfdietrich G., to U.S. Philips Corporation. Phase-locked loop for a directly mixing synchronous AM-receiver. 4,631,499, Cl. 331-11.000.

Katagiri, Shingo: *See*—
Oishi, Kengo; and Katagiri, Shingo, 4,631,620, Cl. 360-133.000.

Kato, Heizaburou, to Sankyo Manufacturing Company, Ltd. Cam arrangement. 4,630,493, Cl. 74-22.00R.

Kato, Hisao, to Mitsubishi Denki Kabushiki Kaisha. Industrial robot system. 4,631,464, Cl. 318-563.000.

Kato, Kiichi: *See*—
Matsubayashi, Nobuhide; Kenjyo, Hideyuki; Kato, Kiichi; and Sakamoto, Masaharu, 4,631,712, Cl. 369-44.000.

Kato, Masatake; and Ikemori, Keiji, to Canon Kabushiki Kaisha. Zoom lens having movable diaphragm. 4,630,899, Cl. 350-427.000.

Kato, Yoshitake: *See*—
Matsumoto, Fujio; and Kato, Yoshitake, 4,630,728, Cl. 206-313.000.

Katsumata, Hiroshi, to Sony Corporation. Cassette loading device. 4,631,607, Cl. 360-96.500.

Katz, Manfred: *See*—
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Kaub, Manfred, to Lucas Industries public limited company. Pressure regulator for hydraulic vehicle braking systems. 4,630,870, Cl. 303-24.00A.

Kaufmann, Richard O. On line scrubbing system for plate and frame heat exchangers. 4,630,672, Cl. 165-95.000.

Kaussen, Manfred: *See*—
Stockhausen, Dolf; Nowak, Rudolf; Chmelir, Miroslav; Kaussen, Manfred; and Dahmen, Kurt, 4,631,063, Cl. 8-94.210.

Kavlico Corporation: *See*—
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Kawaguchi, Masahiro: *See*—
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Kawaguchi, Teruhiko: *See*—
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Kawajiri, Kazuhiro; Sunagawa, Hiroshi; Nozaki, Nobuharu; Hosoi, Yuichi; and Takahashi, Kenji, to Fuji Photo Film Co., Ltd. Radiation image information read-out system. 4,631,407, Cl. 250-327.200.

Kawajiri, Shinobu: *See*—
Imabayashi, Koji; Kawamura, Hiroshi; Takeuchi, Shigeru; Shinobu, Masayoshi; and Kawajiri, Shinobu, 4,631,594, Cl. 358-231.000.

Kawakami, Shigenobu: *See*—
Kano, Masafumi; Tanaka, Megumu; Sato, Atsushi; and Kawakami, Shigenobu, 4,631,632, Cl. 361-315.000.

Kawakubo, Fumio: *See*—
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Kawakubo, Toshio; Ishikawa, Chuji; and Yokoyama, Shizuo, to Ricoh Company, Ltd. Sheet feed apparatus for printer. 4,630,814, Cl. 271-272.000.

Kawamura, Hideaki: *See*—
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Kawamura, Hiroshi: *See*—
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Kawamura, Masahiko: *See*—
Ikawa, Yasuo; Shibata, Tadashi; Urui, Kiyoshi; Miyata, Misao; Kawamura, Masahiko; and Amano, Noboru, 4,631,686, Cl. 364-490.000.

Kawanami, Yoshiharu, to Japan Storage Battery Company Limited. Retainer type lead-acid battery. 4,631,241, Cl. 429-225.000.

Kawanishi, Toshiyuki; Shimada, Masaru; Murakami, Kakuji; Aruga, Tamotsu; and Uemura, Hiroyuki, to Ricoh Company, LTD. Aqueous ink composition for ink-jet recording. 4,631,085, Cl. 106-22.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Nishida, Hiroshi, 4,631,032, Cl. 440-47.000.
Tamba, Shinichi; Ogino, Toru; and Fukui, Noboru, 4,631,153, Cl. 261-52.000.

Kawashima, Hisakazu: *See*—
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Kawashita, Asayoshi; and Kuniga, Hirofumi, to Hitachi, Ltd. Data processing system capable of transferring single-byte and double-byte data under DMA control. 4,631,671, Cl. 364-200.000.

Kayane, Yutaka; Omura, Takashi; Otake, Katsumasa; and Takeshita, Akira, to Sumitomo Chemical Company, Limited. Anthraquinone compound having both monohalogenotriazinyl and vinylsulfone type fiber reactive groups. 4,631,341, Cl. 544-189.000.

Kayser, Didier: *See*—
Guillaume, Paul; Kayser, Didier; and Propice, Jean, 4,630,555, Cl. 110-346.000.

Kayser, Harald; and Schmedemann, Walter, to U.S. Philips Corporation. X-ray apparatus comprising a part mobile thereon. 4,630,796, Cl. 248-648.000.

Kazama, Susumu: *See*—
Uchida, Tetsuei; Uchida, Tsutomu; Tsuchida, Nobuo; and Kazama, Susumu, 4,631,152, Cl. 261-4.000.

Kazmark, Eugene A. Two-wheeled cart with auxiliary wheel. 4,630,837, Cl. 280-47.200.

Keech, David W., to Scott & Fetzer Co., The. T-fitting with one way valve and water level sensor for a sump apparatus. 4,631,001, Cl. 417-3.000.

Keiler, Manfred; Bartsch, Uwe; Drosemeyer, Hans-Heinrich; and Reitsam, Franz X., to Hoechst Aktiengesellschaft. Discharge device for granules. 4,630,382, Cl. 34-173.000.

Keiser, Grant Y.: *See*—
Keiser, Terry L.; and Guinnip, Charles L., 4,630,978, Cl. 408-159.000.

Keiser, Terry L.; and Guinnip, Charles L., to Keiser, Terry L.; and Keiser, Grant Y. Thread chasing tool. 4,630,978, Cl. 408-159.000.

Keith, Robert C.; VandenBerg, Teunis; Randolph, Marshall C.; Lewis, Thomas B.; and Gillis, Patrick J., Jr., to Vacco Industries. Filter insert system. 4,631,126, Cl. 210-108.000.

Keller, Ernst. Automatic dip trimmer apparatus. 4,630,513, Cl. 83-152.000.

Keller, Hans-Hermann: *See*—
Werner, Hans; Knothe, Frank; Graf, Paul; Wallentowitz, Henning; Keller, Hans-Hermann; and Kist, Alfred, 4,630,803, Cl. 267-8.00R.

Keller, Manfred; Kolle, Rudi; Schreiber, Winfried; and Claar, Klaus, to Daimler-Benz Aktiengesellschaft. Fastening clip rotatable in a housing bore. 4,630,330, Cl. 16-2.000.

Keller, Russell D. Anti-siphon fuel filler assembly. 4,630,748, Cl. 220-86.0AT.

Kemnitz, Tadeusz F., to Azionaria Costruzioni Macchine Automatiche. Apparatus and method for automatic system calibration to provide enhanced resolution in computerized weighing systems. 4,630,696, Cl. 177-165.000.

Kemp, Horace N.: *See*—
Harper, Bruce; and Kemp, Horace N., 4,630,427, Cl. 53-460.000.

Kemper, Yves J. Radially oriented nutational traction drive transmission. 4,630,494, Cl. 74-191.000.

Kendall Company, The: *See*—
Dye, John F., 4,631,056, Cl. 604-111.000.
Greenway, John M., 4,630,603, Cl. 128-156.000.

Kendall, Roger V.; and Graber, Charles D., to Da Vinci Laboratories, a division of FoodScience Corporation. N,N-dimethylglycine and use in immune response. 4,631,189, Cl. 424-85.000.

Kendi, Abraham: *See*—
Zvi, Zadok; Kendi, Abraham; and Tal-Mor, Emile, 4,630,396, Cl. 49-55.000.

Kendi Security, Inc.: *See*—
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Kenjyo, Hideyuki: *See*—
Matsubayashi, Nobuhide; Kenjyo, Hideyuki; Kato, Kiichi; and Sakamoto, Masaharu, 4,631,712, Cl. 369-44.000.

Kennedy, Conrad P., Jr., to Gibson, Patrick Howard. Apparatus for liquid filling of containers. 4,630,654, Cl. 141-83.000.

Kennedy, Donald J.: *See*—
Nguyen, Hung T.; Dang, Vu Q.; Duval, Henry H., Jr.; and Kennedy, Donald J., 4,630,965, Cl. 404-107.000.

Kennedy, Kenneth V., to Waldorf Corporation. Bake in tray and method of forming a blank for the same. 4,631,046, Cl. 493-59.000.

Kensey, Kenneth R., to Intravascular Surgical Instruments, Inc. Method and apparatus for surgically removing remote deposits. 4,631,052, Cl. 604-22.000.

Kent, Christopher A.: *See*—
Duddridge, John E.; and Kent, Christopher A., 4,631,135, Cl. 210-764.000.

Kern, Mark T.: *See*—
Cinzori, Robert J.; and Kern, Mark T., 4,630,684, Cl. 169-46.000.

Kernforschungsanlage Julich GmbH: *See*—
Furst, Leander; Ballast, Johan T. G.; and Jahnel, Kurt, 4,630,637, Cl. 137-340.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Maul, Sonja; Buttner, Erwin; Meichelbock, Heiner; Merz, Albert; and Vogg, Hubert, 4,630,464, Cl. 73-28.000.

Kessler, Peter H.; Calvert, Wilson D., Sr.; and Pintchovski, Faivel S., to Motorola, Inc. Heat exchange apparatus for high temperature LPCVD equipment. 4,630,669, Cl. 165-1.000.

Kieser, Jorg, to Leybold-Heraeus GmbH. Apparatus for coating substrates by plasma polymerization. 4,630,568, Cl. 118-723.000.

Kihara, Kazuyuki: *See*—
Akita, Yoshisuke; Tenmyo, Ichiro; Hayashi, Kiyoshi; Kihara, Kazuyuki; and Mito, Akio, 4,630,639, Cl. 137-486.000.

Kim, Il G. Apparatus and process for naso-intestinal intubation. 4,631,054, Cl. 604-54.000.

Kim, Syngcuk, to Columbia University in the City of New York, The Trustees of. Method of desensitizing hypersensitive dentin employing compositions containing potassium salts. 4,631,185, Cl. 424-49.000.

Kimberly-Clark Corporation: *See*—
Lassen, Frederich O.; Peerenboom, Robert J.; and Schultz, Cheri L., 4,631,062, Cl. 604-385.00R.
Van Gompel, Paul T., 4,630,320, Cl. 2-406.000.

Kinashi, Hiroshi: *See*—
Yui, Yuhi; and Kinashi, Hiroshi, 4,630,918, Cl. 355-3.00R.

Kincaid, Herbert; and Favia, Alan D., to Eastern Company. Lock with removable plug. 4,630,457, Cl. 70-369.000.

Kind, Burkhart: *See*—
Nagarkatti, Ashok; Lordo, Robert E.; and Kind, Burkhart, 4,631,510, Cl. 336-135.000.

King, Ronald R., to Wright Line, Inc. Spacer clip. 4,630,737, Cl. 211-40.000.

King, Wendell L., to Medtronic, Inc. Orthogonally-sensing lead. 4,630,611, Cl. 128-642.000.

King, William A.: *See*—
Alexander, James O.; King, William A.; May, William E.; and Pardue, Von G., 4,631,625, Cl. 361-94.000.

Kinnan, Frank R., to Utilitech, Incorporated. Impulse injector apparatus. 4,630,972, Cl. 405-269.000.

Kinoshita, Takao; and Sakai, Shinji, to Canon Kabushiki Kaisha. Still picture recording apparatus and a solid-state image pickup device suitable for this apparatus. 4,631,593, Cl. 358-213.000.

Kinoshita, Tomoaki, to Tokyo Juki Industrial Co., Ltd. Thread cutting mechanism in lock stitch sewing machine. 4,630,559, Cl. 112-291.000.

Kinzer, Norbert: *See*—
Sauerwein, Kurt; Kinzer, Norbert; and Weinlich, Karl, 4,631,415, Cl. 250-497.100.

Kioritz Corporation: *See*—
Kondo, Tadashige; and Inaga, Hisashi, 4,630,590, Cl. 123-602.000.
Nagashima, Akira, 4,630,372, Cl. 30-381.000.

Kirchhoff, Reinhold: *See*—
Wagener, Heinrich; Kirchhoff, Reinhold; Van Heek, Karl H.; and Juntgen, Harald, 4,630,479, Cl. 73-863.830.

Kirschner, Wallace: *See*—
Salazar, Edilberto I.; Kirschner, Wallace; Lorenzo, John L.; Schubert, Keith E.; and Pollak, Philip, Jr., 4,631,681, Cl. 364-464.000.

Kishida, Masatoshi: *See*—
Miyaji, Kenichi; Toida, Shouji; Ito, Seiichi; Watanabe, Isao; and Kishida, Masatoshi, 4,630,742, Cl. 215-13.00R.

Kishimoto, Daisaburo, to Sanyo Electric Co., Ltd; and Tokyo Sanyo Electric Co., Ltd. Refrigerated display cabinet. 4,630,451, Cl. 62-247.000.

Kishner, Stanley J.: *See*—
Zelmanovic, David; and Kishner, Stanley J., 4,631,408, Cl. 250-339.000.

Kissel, William R., to Chrysler Motors Corporation. Electronic fuel injector driver circuit. 4,631,628, Cl. 361-154.000.

Kist, Alfred: *See*—
Werner, Hans; Knothe, Frank; Graf, Paul; Wallentowitz, Henning; Keller, Hans-Hermann; and Kist, Alfred, 4,630,803, Cl. 267-8.00R.

Kitagawa, Junji: *See*—
Yamanoue, Kouichi; and Kitagawa, Junji, 4,631,736, Cl. 375-71.000.

Kitagawa, Tohru; Sakamoto, Koichiro; and Ushijima, Yasuhiro, to Tokyo Electric Co., Ltd. Load cell and method of compensating the same. 4,630,491, Cl. 73-862.670.

Kitagawa, Yoshiaki; and Iwata, Hideo, to Matsushita Electric Works, Ltd. Method of manufacturing heat exchange mat. 4,631,102, Cl. 156-210.000.

Klaeser, Robert S.: *See*—
Dean, George J., Jr.; Klaeser, Robert S.; and Braa, Lloyd W., 4,630,397, Cl. 49-97.000.

Klatt, Alfred, to WABCO Westinghouse Fahrzeugbremsen GmbH. Method and apparatus to determine constant speed torque on an engine. 4,630,508, Cl. 74-866.000.

Klatt, Alfred, to WABCO Westinghouse Fahrzeugbremsen GmbH. Gearshift selection system for a power-assisted transmission. 4,631,679, Cl. 364-424.100.

Klinchuch, John F., to Rockwell International Corporation. Linear controller for electrochemical device and method. 4,631,463, Cl. 318-558.000.

Klingler, Otto; and Gruhler, Siegfried, to Mauser-Werke Oberndorf GmbH. Length measuring device. 4,630,928, Cl. 356-374.000.

Knetsch, Manfred; and Kuhne, Wolfgang, to Robert Bosch GmbH. Method and apparatus for using spring-type resistive elements in a measurement bridge circuit. 4,631,478, Cl. 324-207.000.

Knothe, Frank: *See*—
Werner, Hans; Knothe, Frank; Graf, Paul; Wallentowitz, Henning; Keller, Hans-Hermann; and Kist, Alfred, 4,630,803, Cl. 267-8.00R.

Knowlton, Dale E., to Boeing Company, The. Rivet driving die and method. 4,630,463, Cl. 72-479.000.

Kobayashi, Akira; and Yanagisawa, Fukashi, to Kabushiki Kaisha Sanyo Seiki Seisakusho. Multichannel magnetic head supporting mechanism. 4,631,610, Cl. 360-104.000.

Kobayashi, Hiromu: *See*—
Yoshimura, Syushichi; Kobayashi, Hiromu; Toyonaga, Yoshikazu; Yamazaki, Hozo; and Karatsu, Masanori, 4,631,180, Cl. 423-450.000.

Kobayashi, Jun'ichi: *See*—
Rinehart, Kenneth L., Jr.; Harbour, Gary C.; and Kobayashi, Jun'ichi, 4,631,149, Cl. 540-546.000.

Kobayashi, Michio; Yoshida, Masato; Sawada, Hideo; Hagii, Hidehiko; and Aoshima, Kazuyoshi, to Nippon Oil & Fars Co., Ltd. Method for production of fluorine-containing aromatic derivative. 4,631,151, Cl. 260-408.000.

Kobayashi, Shigeyoshi: *See*—
Yamabe, Masaaki; Kobayashi, Shigeyoshi; Yoshihara, Noriyuki; and Nakamura, Masaru, 4,631,075, Cl. 55-158.000.

Kobayashi, Shouzou, to Kabushiki Kaisha Toshiba. Thermal recorder paper stacker. 4,631,552, Cl. 346-136.000.

Kobayashi, Toshio, to Fuji Jukogyo Kabushiki Kaisha. Transmission for a four-wheel drive motor vehicle. 4,630,705, Cl. 180-247.000.

Koch Carbon Inc.: *See*—
Casper, Robert K.; and Runner, James F., 4,631,025, Cl. 432-15.000.

Koch, Elmar; and Gleich, Hermann, to Mabu-Pressen Maschinenfabrik Karl Burkard KG. Eccentric press. 4,630,516, Cl. 83-530.000.

Koch, Otto: *See*—
Wingler, Frank; Koch, Otto; Lindner, Christian; and Reinking, Klaus, 4,631,311, Cl. 525-67.000.

Koeck, Klaus, to Licentia Patent-Verwaltungs-G.m.b.H. Service integrated transmission system. 4,631,720, Cl. 370-84.000.

Koehle, Siegfried E., to Berg Steel Pipe Corp. Bevel end protector. 4,630,646, Cl. 138-96.00R.

Kohler, Mark L.: *See*—
Brown, Donald W., Jr.; and Kohler, Mark L., 4,630,781, Cl. 241-159.000.

Kohlpaintner, Georg: *See*—
Bienert, Horst; and Kohlpaintner, Georg, 4,630,859, Cl. 296-217.000.

Kohne, Bernd: *See*—
Praefcke, Klaus; Kohne, Bernd; Poules, Wadi; and Poetsch, Eike, 4,631,143, Cl. 252-299.620.

Koibuchi, Nobutaka: *See*—
Kurihara, Mitsuo; Sato, Fumio; Iwasawa, Yoshiyuki; Koibuchi, Nobutaka; and Harada, Hiroshi, 4,631,076, Cl. 55-283.000.

Koike, Shin'ichi: *See*—
Ono, Tatsuhiro; Koike, Shin'ichi; Tsuchiya, Haruhiko; and Inoue, Yuji, 4,631,721, Cl. 370-85.000.

Koishi, Toshio; and Yasumura, Takashi, to Central Glass Company Limited. Curable fluorine-containing copolymer and coating liquid composition using same. 4,631,326, Cl. 526-249.000.

Kokado, Masayuki; and Sumi, Hidezi, to Fujitsu Limited. PNPN integrated circuit protective device with integral resistor. 4,631,567, Cl. 357-38.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Tanaka, Fujio; and Imamura, Nobutake, 4,631,617, Cl. 360-131.000.

Kolle, Rudi: *See*—
Keller, Manfred; Kolle, Rudi; Schreiber, Winfried; and Claar, Klaus, 4,630,330, Cl. 16-2.000.

Koller, Anton. Mixture for the care and cleaning of contact lenses. 4,631,072, Cl. 51-309.000.

Kollmorgen Technologies Corporation: *See*—
Zelmanovic, David; and Kishner, Stanley J., 4,631,408, Cl. 250-339.000.

Komamura, Tawara; Suginaka, Shunji; and Tachibana, Kimie, to Konishiroku Photo Industry Co., Ltd. Heat-developable color photo-sensitive material with polymeric coupler. 4,631,251, Cl. 430-548.000.

Komukai, Shigemi, to Tokico Ltd. Fuel supply system. 4,630,754, Cl. 222-28.000.

Komuro, Katsusuke: *See*—
Irimajiri, Shoichiro; Komuro, Katsusuke; and Aikawa, Kunihiko, 4,630,702, Cl. 180-215.000.

Kondo, Asaji, to Fuji Photo Film Co., Ltd. Multilayer chemical analysis member having an outer waterproof layer. 4,631,174, Cl. 422-56.000.

Kondo, Tadashige; and Inaga, Hisashi, to Kioritz Corporation. Internal combustion engine apparatus. 4,630,590, Cl. 123-602.000.

Kondo, Toru: *See*—
Ishiguro, Minoru; Kaneko, Kouji; and Kondo, Toru, 4,630,916, Cl. 354-418.000.

Konig, Joachim; and Korte, Siegfried, to Bayer Aktiengesellschaft. Production of sulphonic acid group-containing acrylonitrile polymers and monomers therefor. 4,631,317, Cl. 525-383.000.

Konigshofen, Heinrich: *See*—
Buding, Hartmuth; Fiedler, Paul; Konigshofen, Heinrich; and Thormer, Joachim, 4,631,315, Cl. 525-338.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Komamura, Tawara; Suginaka, Shunji; and Tachibana, Kimie, 4,631,251, Cl. 430-548.000.

Kono, Kazunori: *See*—
Ohmori, Shunji; Takenaka, Hiroyuki; Hozoji, Akira; Kono, Kazunori; Yoshikawa, Kiyomitsu; and Kajihara, Seishi, 4,630,514, Cl. 83-342.000.

Koppers, Manfred: *See*—
Heintzmann, Peter; Koppers, Manfred; Bohnes, Karlheinz; and Domanski, Lothar, 4,630,973, Cl. 405-288.000.

Korb, Jean P.; and Lagrue, Jean P., to Regie Nationale des Usines Renault. Process for optimizing the ignition advance of an internal combustion engine. 4,631,680, Cl. 364-431.050.

Korba, Larry, to Canadian Patents and Deveopment Limited—Societe Canadienne des Brevets et d'Exploitation Limitee. Computer speed control. 4,631,702, Cl. 364-900.000.

Korsunsky, Iosif; and Grabbe, Dimitry, to AMP Incorporated. Chip carrier socket which requires low insertion force for the chip carrier. 4,630,875, Cl. 339-17.0CF.

Korte, Kevin R.; and Wu, Dan T., to Brown & Williamson Tobacco Corp. Process for treating tobacco. 4,630,619, Cl. 131-296.000.

Korte, Siegfried: *See*—
Konig, Joachim; and Korte, Siegfried, 4,631,317, Cl. 525-383.000.

Kose, Saburo: *See*—
Ebata, Yoshihiro; Kose, Saburo; and Hayami, Ryozo, 4,631,099, Cl. 156-89.000.

Koshimaru, Shigeru, to NEC. Logic gate circuit having P- and N-channel transistors coupled in parallel. 4,631,425, Cl. 307-449.000.

Koshiyama, Hideo; Sakai, Fumihide; and Ohkuma, Hiroaki, to Bristol-Myers Company. Fermentation process for BBM-928. 4,631,256, Cl. 435-68.000.

Kossuth, Donald A., to National Gypsum Company. Embossed gypsum board. 4,631,097, Cl. 156-44.000.

Koster, Detlef. Demountable multi-purpose light table. 4,631,643, Cl. 362-97.000.

Kotobuki Seiyaku Co., Ltd.: *See*—
Tomiyama, Tsuyoshi; and Tomiyama, Akira, 4,631,292, Cl. 514-452.000.

Kovens, Michael L.: *See*—
De Witt, Kenneth I.; and Kovens, Michael L., 4,631,527, Cl. 340-539.000.

Kowalski, Bruce R.; and Rohrback, Gilson H., to Rohrback Technology Corporation. Method and apparatus for analysis employing multiple separation processes. 4,631,687, Cl. 364-497.000.

Kozlik, Tony J., to Honeywell Inc. Detector of predetermined patterns of encoded data signals. 4,631,695, Cl. 364-715.000.

Kozuma, Jiro; Hamaguchi, Hirohiko; Shibahara, Tetsuya; and Strasser, Joseph P., to Dow Chemical Japan Limited. Method for incorporating chlorpyrifos into thermoplastic resins. 4,631,301, Cl. 523-122.000.

Kraatz, Udo; Buchel, Karl H.; Hanssler, Gerd; Brandes, Wilhelm; and Reinecke, Paul, to Bayer Aktiengesellschaft. Triazolylmethyl-pyridyloxymethyl-carbinol fungicides. 4,631,288, Cl. 514-340.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Heck, Reinhard, 4,631,164, Cl. 376-300.000.

Kramer, Hermann: *See*—
Harder, Hans E.; and Kramer, Hermann, 4,630,601, Cl. 128-92.0YZ.

Kramer, Vance M., Jr.: *See*—
Kramer, Vance M., Sr.; and Kramer, Vance M., Jr., 4,630,350, Cl. 29-453.000.

Kramer, Vance M., Sr.; and Kramer, Vance M., Jr. Method for making a flexible corrugated rubber tubing with internal reinforcement. 4,630,350, Cl. 29-453.000.

Krantz America, Inc.: *See*—
Morizzo, Nicholas L., 4,630,339, Cl. 26-70.000.

Kranz, Eckhard; and Duren, Karl, to Mannesmann AG. Making clad seamless pipes. 4,630,351, Cl. 29-527.200.

Krauss-Maffei Aktiengesellschaft: *See*—
Titus, Hans-Joachim, 4,631,048, Cl. 494-13.000.

Krauss, Werner, to Claudius Peters AG. Bulk silo. 4,630,531, Cl. 98-52.000.

Kretzschmar, Klaus: *See*—
Markert, Helmut; Hauschildt, Klaus-Robert; Rogler, Wolfgang; and Kretzschmar, Klaus, 4,631,306, Cl. 523-457.000.

Kricheldorf, Hans R.; Pakull, Ralf; and Dicke, Hans-Rudolf, to Bayer Aktiengesellschaft. Process for the preparation of polyimide esters of trimellitic acid. 4,631,333, Cl. 528-170.000.

Kridl, Thomas A.: *See*—
Pithouse, Kenneth B.; Kridl, Thomas A.; and Triplett, James T., 4,631,098, Cl. 156-86.000.

Kristiansen, Leif A.: *See*—
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Kroh, Adolf: *See*—
Dietz, Erwin; Munkel, Albert; Hafner, Otmar; Rieper, Wolfgang; and Kroh, Adolf, 4,631,330, Cl. 528-49.000.

Kroll, Hein-Peter: *See*—
Lockhoff, Oswald; Kruger, Bernd-Wieland; Stadler, Peter; Metzger, Karl G.; Kroll, Hein-Peter; Schaller, Klaus; and Zeiler, Hans-Joachim, 4,631,272, Cl. 514-23.000.

Kronberger, Leonard J., to Chrysler Motors Corporation. Labyrinth for an ignition distributor cap and rotor assembly with atmospheric purging action. 4,631,370, Cl. 200-19.00R.

Kronberger, Leonard J., to Chrysler Motors Corporation. Wet surface tracking resistance for an ignition distributor cap. 4,631,371, Cl. 200-19.0DC.

Kronberger, Leonard J., to Chrysler Motors Corporation. Plastic hub and interrupter assembly for an ignition distributor. 4,631,372, Cl. 200-19.00R.

Kronenberg, Stanley; McLaughlin, William L.; and Seibentritt, Carl R., Jr., to United States of America, Army. Radiological instrument. 4,631,414, Cl. 250-474.100.

Krueger, David E.: *See*—
Peeters Weem, Jan A.; Krueger, David E.; and Graham, Dennis P., 4,630,856, Cl. 294-81.530.

Kruesi, Paul R., to Cato Research Corporation. Recovery of anhydrous zinc chloride. 4,631,176, Cl. 423-100.000.

Kruger, Bernd-Wieland: *See—*
Lockhoff, Oswald; Kruger, Bernd-Wieland; Stadler, Peter; Metzger, Karl G.; Kroll, Hein-Peter; Schaller, Klaus; and Zeiler, Hans-Joachim, 4,631,272, Cl. 514-23.000.

Kruger, Edmund R., to Lear Siegler, Inc. Method for making a porous rigid structure and the porous rigid structure made thereby. 4,631,228, Cl. 428-316.600.

Krupey, John: *See—*
Giorgio, Nicholas A.; Krupey, John; and Wilson, Leonard T., 4,631,254, Cl. 435-7.000.

Kryszewski, Marian: *See—*
Piorkowska-Palczewska, Ewa; Galeski, Andrzej; and Kryszewski, Marian, 4,630,938, Cl. 374-44.000.

Ku, San-Mei: *See—*
Christie, Rosemary; Hwang, Bao-Tai; Ku, San-Mei; and Sickler, Janet M., 4,630,356, Cl. 29-576.00W.

Kubo, Haruaki, to Dai Showa Seiki Kabushiki Kaisha. Chuck assembly for a machine tool. 4,630,980, Cl. 409-234.000.

Kubo, Kanji; and Izumi, Chikahiko, to Hitachi, Ltd. Storage system using comparison and merger of encached data and update data at buffer to cache to maintain data integrity. 4,631,668, Cl. 364-200.000.

Kubota, Kazuhisa; and Ichikawa, Takafumi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Steering switch pad apparatus. 4,630,501, Cl. 74-484.00R.

Kubota, Shigeo: *See—*
Ohsato, Kiyoshi; and Kubota, Shigeo, 4,631,397, Cl. 250-201.000.

Kubozuka, Takao: *See—*
Ogawa, Naoki; Kubozuka, Takao; and Hirano, Yoshinori, 4,630,573, Cl. 123-41.270.

Kuchiki, Kiyoshi: *See—*
Akasofu, Kyosuke; and Kuchiki, Kiyoshi, 4,631,684, Cl. 364-474.000.

Kugler, Artur; Reppert, Rudi; and Zaunberger, Franz-Xaver, to Zahnraderfabrik Renk Aktiengesellschaft. Drive system with flow brake. 4,630,507, Cl. 74-733.000.

Kuhne, Wolfgang: *See—*
Knetsch, Manfred; and Kuhne, Wolfgang, 4,631,478, Cl. 324-207.000.

Kulp, Rodney J.; and Furey, Andrew J., to Pilling Co. Gauge for extensible-blade surgical knife. 4,630,378, Cl. 33-185.00R.

Kumpitsch, Robert C.; Retersdorf, James P.; and Lewis, Charles W., to General Electric Company. Immediately testable superconductor joint. 4,630,881, Cl. 339-176.00R.

Kuniga, Hirofumi: *See—*
Kawashita, Asayoshi; and Kuniga, Hirofumi, 4,631,671, Cl. 364-200.000.

Kunimori Kagaku Co., Ltd.: *See—*
Shiotani, Yosuke, 4,630,745, Cl. 220-6.000.

Kuo, Dai-Ming. Spraying-angle selector for a toilet having adjustable water-spray nozzles. 4,630,322, Cl. 4-420.400.

Kuo, Meng S.: *See—*
Chu, Mosi; and Kuo, Meng S., 4,630,950, Cl. 400-639.100.

Kurihara, Mitsuo; Sato, Fumio; Iwasawa, Yoshiyuki; Koibuchi, Nobutaka; and Harada, Hiroshi, to Tokyo Roki Co., Ltd.; and Shimizu Construction Co., Ltd. Apparatus for removing carbon particles from exhaust gas from internal combustion engine. 4,631,076, Cl. 55-283.000.

Kuroda, Akio: *See—*
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,631,717, Cl. 369-276.000.

Kurz, Craven H. Orthodontic tool. 4,631,028, Cl. 433-4.000.

Kushner, David J.: *See—*
Burton, James R.; and Kushner, David J., 4,631,139, Cl. 252-49.300.

Kuttner, Thomas; Straubel, Max; and Wessel, Wolf, to Robert Bosch GmbH. Arrangement for rapidly adjusting an electromagnetic load associated with an internal combustion engine. 4,630,582, Cl. 123-339.000.

Kwai Lo, Peter Y.: *See—*
Chandra, Grish; and Kwai Lo, Peter Y., 4,631,310, Cl. 524-862.000.

Kyster, Erik: *See—*
Petersen, Hans C.; and Kyster, Erik, 4,631,010, Cl. 418-61.00B.

Kyushu Hitachi Maxell, Ltd.: *See—*
Ochiai, Masahiko, 4,631,373, Cl. 200-43.170.

L.C.C.-C.I.C.E.-Compagnie Europeenne des Composants Electroniques-36: *See—*
Roy, Claude, 4,630,784, Cl. 242-56.100.

La Telemecanique Electrique: *See—*
Gohl, Pierre, 4,631,623, Cl. 361-86.000.
Guery, Jean-Pierre; Gashet, Gerald; Olifant, Jacques; and Plumeret, Raymond, 4,631,507, Cl. 335-27.000.

LaBate, Michael D. Coated refractory shapes useful in bottom pouring of ingots in ingot molds. 4,630,667, Cl. 164-363.000.

Labender, Ron: *See—*
Burkeen, Ralph D.; and Labender, Ron, 4,630,390, Cl. 43-43.110.

Lacey, Robert S.: *See—*
Graham, Stephen L.; Plunkett, David O.; and Lacey, Robert S., 4,631,308, Cl. 524-272.000.

Lachman, Irwin M.; and Nordlie, Lawrence A., to Corning Glass Works. Method of producing high-strength high surface area catalyst supports. 4,631,267, Cl. 502-439.000.

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Lacour, Gilbert, to Clesse-Mandet. Pressure-reducing apparatus. 4,630,641, Cl. 137-505.380.

Lacroix, Marc: *See—*
Boehm, Bernard; and Lacroix, Marc, 4,631,688, Cl. 364-507.000.

Ladd, James E., Jr., to Laura Lupton, Inc. Cosmetic powder dispenser and applicator. 4,630,954, Cl. 401-123.000.

Ladd, James E., Jr.; and Jacobs, David R., to Laura Lupton Inc. Cosmetic powder dispenser and applicator. 4,630,955, Cl. 401-123.000.

Lafayette Instrument Co., Inc.: *See—*
Wastl, Max, Sr., 4,630,485, Cl. 73-861.560.

Lagerquist, William B.: *See—*
Menne, Eugene P.; Lagerquist, William B.; and Decko, Del P., 4,631,034, Cl. 440-7.000.

Lagree, James L.; and Elms, Robert T., to North American Philips Lighting Corporation. Ballast adaptor for improving operation of fluorescent lamps. 4,631,450, Cl. 315-244.000.

Lagrue, Jean P.: *See—*
Korb, Jean P.; and Lagrue, Jean P., 4,631,680, Cl. 364-431.050.

Lahres, Hans: *See—*
Bammert, Hubert; Lahres, Hans; and Mosch, Egon, 4,630,906, Cl. 351-159.000.

Laigle, Jean-Claude: *See—*
Combourieu, Michel; Bernet, Yvon; Laigle, Jean-Claude; and Simbille, Nadine, 4,631,277, Cl. 514-239.000.

L'Air Liquide: *See—*
Guillaume, Paul; Kayser, Didier; and Propice, Jean, 4,630,555, Cl. 110-346.000.

Laird, Kevin M.; and Rozanski, Walt, to Motorola, Inc. FM signal magnitude quantizer and demodulator compatible with digital signal processing. 4,631,489, Cl. 329-110.000.

Laisney, Bernard; and Duvernay, Maurice, to Rhone-Poulenc Specialites Chimiques. Burn resistant organopolysiloxane foams. 4,631,299, Cl. 521-77.000.

Laitram Corporation, The: *See—*
Fowler, John T., 4,631,711, Cl. 367-149.000.
Lapeyre, James M., 4,631,700, Cl. 364-900.000.

Lalancette, Jean M.; and Belanger, Germain, to Hydro-Quebec. Process for the destruction of toxic organic products. 4,631,183, Cl. 423-659.000.

Lamb, Gordon: *See—*
Clarke, Kenneth J.; and Lamb, Gordon, 4,630,450, Cl. 62-222.000.

Lambert, Harvey J.: *See—*
Johnston, Gary L.; and Lambert, Harvey J., 4,630,721, Cl. 192-58.00B.

Lambert, James; and Rice, William E., to Mobil Oil Corporation. Apparatus for dispensing plastics stretch film. 4,630,786, Cl. 242-96.000.

Lambert, Michael B.: *See—*
Bergstrom, Gary C.; and Lambert, Michael B., 4,630,481, Cl. 73-437.000.

Lamico, Inc.: *See—*
Urban, Ted. F., 4,630,626, Cl. 135-84.000.

Landoll Corporation: *See—*
Landoll, Donald R.; Swart, Kyle D.; and Morris, Joseph B., 4,630,991, Cl. 414-478.000.

Landoll, Donald R.; Swart, Kyle D.; and Morris, Joseph B., to Landoll Corporation. Truck having tiltable front and rear frames. 4,630,991, Cl. 414-478.000.

Lang, James W.: *See—*
Perovick, Matthew J.; and Lang, James W., 4,630,599, Cl. 128-66.000.

Lang, Willibald: *See—*
Ledwon, Erhard; and Lang, Willibald, 4,630,595, Cl. 126-417.000.

Langeder, Rudolf: *See—*
Buchegger, Rudolf; and Langeder, Rudolf, 4,630,785, Cl. 242-72.100.

Langman, Richard A.; Giovanini, Donald R.; and Letzig, Michael P., to Coors Porcelain Company. Method of manufacturing ceramic substrate for fine-line electrical circuitry. 4,631,160, Cl. 264-62.000.

Lanham Machinery Company, Inc.: *See—*
Lanham, William E.; and Smith, Stephen R., 4,631,029, Cl. 432-133.000.

Lanham, William E.; and Smith, Stephen R., to Lanham Machinery Company, Inc. Baking oven with heated air distribution-II. 4,631,029, Cl. 432-133.000.

Lantel International Corp.: *See—*
Coviello, Frank; and Antico, Michael, 4,631,367, Cl. 379-157.000.

Lapeyre, James M., to Laitram Corporation, The. Magnetically coded software for multi-purpose computer. 4,631,700, Cl. 364-900.000.

Lapins, Daniel W.; and Szymanski, Richard, to Haworth, Inc. Acoustical panel. 4,630,416, Cl. 52-239.000.

Larabie, Ludger. Wood stove. 4,630,592, Cl. 126-4.000.

Larad Equipment Corporation: *See—*
Bernstein, Robert E.; and Nelson, Alan E., 4,630,635, Cl. 137-315.000.

Larrabee, Graydon B., to Texas Instruments Incorporated. Germanium hardened silicon substrate. 4,631,234, Cl. 428-428.000.

Larsson, Nils-Olof, to Kalmar LMV. Adjustable operator cab on a motor-drive truck. 4,630,700, Cl. 180-89.130.

LaRue, Donald D., to Hydrotile Machinery Company. Bulk material hopper. 4,630,988, Cl. 414-327.000.

Lashof, Daniel A.: *See—*
Tans, Petrus P.; and Lashof, Daniel A., 4,630,923, Cl. 356-301.000.

Lassen, Frederich O.; Peerenboom, Robert J.; and Schultz, Cheri L., to Kimberly-Clark Corporation. Labial sanitary pad. 4,631,062, Cl. 604-385.00R.

Lau, Bernhard: *See—*
Forker, Dieter; Hassler, Joachim; Lau, Bernhard; and Schmidt, Rolf, 4,630,909, Cl. 354-1.000.

Laufer, Helmut: *See—*
Hofer, Gerald; Hofmann, Eberhard; Laufer, Helmut; Rossignol, Francois; Schwartz, Reinhard; Straubel, Max; and Tissot, Raymond, 4,630,587, Cl. 123-502.000.

Laughlin, Lonnie C.: *See—*
Null, Robert A.; Laughlin, Lonnie C.; and Goldberg, Michael L., 4,631,073, Cl. 55-18.000.

Laugier, Noel: *See—*
Berthet, Hubert; Laugier, Noel; and Ricome, Bernard, 4,630,968, Cl. 405-195.000.

Laura Lupton, Inc: *See—*
Ladd, James E., Jr., 4,630,954, Cl. 401-123.000.

Laura Lupton Inc.: *See—*
Ladd, James E., Jr.; and Jacobs, David R., 4,630,955, Cl. 401-123.000.

Lauriello, Philip J. J.; and Slavin, Lawrence M., to AT&T Bell Laboratories. Lightguide distributing unit. 4,630,886, Cl. 350-96.200.

Laurier, Jean-Pierre: *See—*
Hales, Patrick; Laurier, Jean-Pierre; and Pradet, Gerard, 4,630,596, Cl. 128-1.00R.

Lavallee, Francois A., to Essex Group, Inc. Method for insulating a magnet wire with tetraalkyl titanate modified nylon. 4,631,201, Cl. 427-118.000.

Law, Hsiang-Yi D.: *See—*
Goodwin, Frank E.; Law, Hsiang-Yi D.; Morrison, Charles B.; and Figueroa, Luis, 4,631,729, Cl. 372-44.000.

Leadvaro, Stephen J.: *See—*
English, George J.; Gagnon, Peter R.; and Leadvaro, Stephen J., 4,631,446, Cl. 313-634.000.

Lear Siegler, Inc.: *See—*
Kruger, Edmund R., 4,631,228, Cl. 428-316.600.

Ledwon, Erhard; and Lang, Willibald. Energy collector for heat pump installations. 4,630,595, Cl. 126-417.000.

Lee, Chi-Long: *See—*
Gornowicz, Gerald A.; and Lee, Chi-Long, 4,631,329, Cl. 528-28.000.

Lee, Fui-Tseng H.: *See—*
Braksmayer, Diza P.; Lee, Fui-Tseng H.; and Scholer, Fred R., 4,631,148, Cl. 252-609.000.

Lee, Minyoung: *See—*
Thomas, Charles E.; Lee, Minyoung; Bedard, James F.; Hayashi, Steven R.; and Yerazunis, William S., 4,631,683, Cl. 364-474.000.

Lee, Wayne, to RCA Corporation. Kinescope with compensated conduction characteristic. 4,631,591, Cl. 358-190.000.

Legawiec, Ronald F.: *See—*
Massaro, Peter C.; and Legawiec, Ronald F., 4,630,442, Cl. 60-415.000.

Lehman, Scott: *See—*
Braun, Hilarion; Lush, Linda; and Lehman, Scott, 4,631,549, Cl. 346-1.100.

Lehrer, William I.: *See—*
Pierce, John M.; and Lehrer, William I., 4,630,343, Cl. 29-576.00W.

Leibbrandt, Friedrich: *See—*
Thormer, Joachim; Leibbrandt, Friedrich; Szentivanyi, Zsolt; and Buding, Hartmuth, 4,631,309, Cl. 524-426.000.

Leitner, Lutz: *See—*
Naumann, Rolf; Leitner, Lutz; Rademachers, Jakob; and Buxbaum, Gunter, 4,631,090, Cl. 106-304.000.

Leman, Jean-Luc; Russier, Michel V.; and Suzzi, Robert J., to Aerospatiale Societe Nationale Industrielle. Apparatus for control of collective and cyclic pitch of the blades of a rotor. 4,630,998, Cl. 416-134.00A.

Lemo M Lehmacher & Sohn GmbH Maschinenfabrik: *See—*
Dreckmann, Karl; and Miesen, Theo, 4,631,047, Cl. 493-227.000.

Lenart, Stanley. Headlamp assembly. 4,631,645, Cl. 362-105.000.

Leng, Douglas E.: *See—*
Akers, James B., Jr.; Leng, Douglas E.; and Normand, Randall J., 4,631,175, Cl. 422-135.000.

Lenk, Erich: *See—*
Bauer, Karl; Hanisch, Michael; and Lenk, Erich, 4,630,340, Cl. 28-187.000.

Leonard, Vurnen J.: *See—*
Erickson, Leif O.; and Leonard, Vurnen J., 4,631,609, Cl. 360-135.000.

Leone, David A., to Westinghouse Electric Corp. Molded case circuit breaker with an improved arc gas external venting system. 4,631,376, Cl. 200-306.000.

Les Cables de Lyon: *See—*
Dubar, Thierry, 4,630,888, Cl. 350-96.230.

Lesch, Hans-Bernd, to Sapal Societe Anonyme des Plieuses Automatiques. Method and apparatus for placement of small articles, such as candies or chocolates in predetermined positions in a receiver. 4,630,428, Cl. 53-474.000.

Letzig, Michael P.: *See—*
Langman, Richard A.; Giovanini, Donald R.; and Letzig, Michael P., 4,631,160, Cl. 264-62.000.

Leuenberger, Claude-Eric, to Asulab S.A. Electronic timepiece. 4,630,936, Cl. 368-66.000.

Levenberg, Nat, to Jefsteel Business Equipment Corp. Stationery rack construction. 4,630,739, Cl. 211-189.000.

Levin, Eliezar. Collapsible playground device. 4,630,819, Cl. 272-113.000.

Levine, Seymour D.: *See—*
Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,631,283, Cl. 514-259.000.

Levrai, Roland; Courbot, Pierre; and Picot, Pascal, to Societe Anonyme D.B.A. Device for lubricating a geartrain. 4,630,711, Cl. 184-6.120.

Lewis, Charles W.: *See—*
Kumpitsch, Robert C.; Retersdorf, James P.; and Lewis, Charles W., 4,630,881, Cl. 339-176.00R.

Lewis, Thomas B.: *See—*
Keith, Robert C.; VandenBerg, Teunis; Randolph, Marshall C.; Lewis, Thomas B.; and Gillis, Patrick J., Jr., 4,631,126, Cl. 210-108.000.

Leybold-Heraeus GmbH: *See—*
Kieser, Jorg, 4,630,568, Cl. 118-723.000.

Li, Wu S., to Minnesota Mining and Manufacturing Company. Tamper resistant security film. 4,630,891, Cl. 350-105.000.

Libby, Scott: *See—*
Love, John E.; Neal, Archie E.; and Libby, Scott, 4,630,432, Cl. 56-220.000.

Libman, Jacqueline: *See—*
Shanzer, Abraham; and Libman, Jacqueline, 4,631,291, Cl. 514-450.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Koeck, Klaus, 4,631,720, Cl. 370-84.000.

Liebing, Lothar, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Apparatus for receiving electromagnetic radiation. 4,631,398, Cl. 250-216.000.

Light Signatures, Inc.: *See—*
Sanner, M. Duane, 4,630,845, Cl. 283-91.000.

Limanowski, Jozef K.: *See—*
Hodges, C. Wayne; and Limanowski, Jozef K., 4,631,631, Cl. 361-306.000.

Lind, Larry W., to United States Elevator Corporation. Suspended-ceiling framework assembly. 4,630,423, Cl. 52-484.000.

Lind, Theodore E.: *See—*
DeFreese, Jeffrey A.; and Lind, Theodore E., 4,631,197, Cl. 427-10.000.

Lindberg, Charles H. Method and apparatus for sharpening tungsten electrodes. 4,631,027, Cl. 432-13.000.

Lindblad, Nero R.: *See—*
Silverberg, Mort; Maus, Richard G.; and Lindblad, Nero R., 4,630,920, Cl. 355-15.000.

Linder, Carl O.: *See—*
McCollum, Patrick E.; Brownrigg, James K.; and Linder, Carl O., 4,631,472, Cl. 323-325.000.

Lindner, Christian: *See—*
Wingler, Frank; Koch, Otto; Lindner, Christian; and Reinking, Klaus, 4,631,311, Cl. 525-67.000.

Lindsay, Bruce G.: *See—*
Haas, Laura M.; and Lindsay, Bruce G., 4,631,673, Cl. 364-300.000.

Lingenfelter, Ralph E., to Chipman-Union, Inc. Triple roll, layer top, sock. 4,630,455, Cl. 66-172.00R.

Lisle, Jerry H.: *See—*
Brown, Larry L.; and Lisle, Jerry H., 4,630,317, Cl. 2-12.000.

Little, Percy A.: *See—*
Walton, Paul G.; and Little, Percy A., 4,630,694, Cl. 175-391.000.

Little Rapids Corp.: *See—*
Thomson, Loronzo H., 4,630,761, Cl. 222-551.000.

Liu, King. Pedal link assembly for bicycle. 4,630,503, Cl. 74-594.200.

Lo, Allen K. W. Extended depth-of-field 3-D camera. 4,630,913, Cl. 354-115.000.

Locacius, Robert F., to Felt Products Mfg. Co. Head gasket and sealing assembly for a V-engine at the intersection of a block, a head and an intake manifold cover. 4,630,835, Cl. 277-235.00B.

LoCicero, Joseph L.; Pazarci, Melih; and Rzeszewski, Theodore S., to AT&T Bell Laboratories. Compatible high-definition television with extended aspect ratio. 4,631,574, Cl. 358-12.000.

Lockhoff, Oswald; Kruger, Bernd-Wieland; Stadler, Peter; Metzger, Karl G.; Kroll, Hein-Peter; Schaller, Klaus; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. N-acylated 1-alkylamino-1-deoxyketose derivatives, a process for their preparation and their use. 4,631,272, Cl. 514-23.000.

Lohrer, Josef: *See—*
Erhardt, Manfred; Loos, Herbert; Lohrer, Josef; Schapp, Udo; Schaeferling, Karl-Josef; and Freundl, Walter, 4,630,402, Cl. 51-105.0GG.

Lok, Cornelis M.: *See—*
Oudejans, Johannes C.; Nootenboom, Peter; Ganguli, Keshab L.; and Lok, Cornelis M., 4,631,265, Cl. 502-259.000.

Lokari-Tuote Oy: *See—*
Venetjoki, Juhani T., 4,630,701, Cl. 180-209.000.

Long, Charles A., Jr., to Long Technologies, Inc. Remotely controlled hydraulic cutter apparatus. 4,630,676, Cl. 166-55.000.

Long, Michael E.: *See—*
Brugliera, Vito; Green, George R. J.; and Long, Michael E., 4,631,601, Cl. 358-335.000.

Long Technologies, Inc.: *See—*
Long, Charles A., Jr., 4,630,676, Cl. 166-55.000.

Loos, Herbert: *See—*
Erhardt, Manfred; Loos, Herbert; Lohrer, Josef; Schapp, Udo; Schaeferling, Karl-Josef; and Freundl, Walter, 4,630,402, Cl. 51-105.0GG.
Erhardt, Manfred; and Loos, Herbert, 4,630,404, Cl. 51-105.0GG.

Lorch, Werner, to Hans Grohe GmbH & Co. KG. Valve, particularly mixing valve. 4,630,643, Cl. 137-597.000.

Lordo, Robert E.: *See—*
Nagarkatti, Ashok; Lordo, Robert E.; and Kind, Burkhart, 4,631,510, Cl. 336-135.000.

Lorenzo, John L.: *See—*
Salazar, Edilberto I.; Kirschner, Wallace; Lorenzo, John L.; Schubert, Keith E.; and Pollak, Philip, Jr., 4,631,681, Cl. 364-464.000.

Loskorn, Richard A.: *See—*
Harris, Craig W.; Jevons, Lyle O., Jr.; and Loskorn, Richard A., 4,631,666, Cl. 364-200.000.

Loughborough Consultants Limited: *See—*
Harry, John E., 4,631,452, Cl. 315-334.000.

Love, John E.; Neal, Archie E.; and Libby, Scott, to J. E. Love Company. Pick-up tine assembly for harvester reels. 4,630,432, Cl. 56-220.000.

Lovgren, Anders, to AB Megaron. Device at combustion plants for automatical feeding of fuels within the fireplace of the plant. 4,630,552, Cl. 110-190.000.

Lovin, Arthur. Sand trap practice device. 4,630,828, Cl. 273-176.0FB.

Lowrie, Alastair C. B.: *See—*
Stjarne, Olov G.; Severinsson, Lars M.; and Lowrie, Alastair C. B., 4,630,714, Cl. 188-206.00R.

LSI Logic Corporation: *See—*
Pasch, Nicholas, 4,631,248, Cl. 430-313.000.

Lucas Industries public limited company: *See—*
Kaub, Manfred, 4,630,870, Cl. 303-24.00A.
Moore, Raymond, 4,630,476, Cl. 73-293.000.
Reynolds, Desmond H. J.; and Taft, Philip A., 4,630,630, Cl. 137-68.100.

Lucas, Ronald J.; Berry, Ivan L.; and Wolfe, John C., to University of Houston, The. Methods and devices for charged beam accessible data storage. 4,631,704, Cl. 365-126.000.

Ludwig, Frank A., to Hughes Aircraft Company. Method of monitoring trace constituents in plating baths. 4,631,116, Cl. 204-1.00T.

Lukasik, Stanley J.: *See—*
Shaulov, Avner A.; Lukasik, Stanley J.; Frommer, Myron H.; and Zwicker, Walter K., 4,631,633, Cl. 361-321.000.

Luker, Peter A.: *See—*
Young, Ian R.; Evans, Philip R.; and Luker, Peter A., 4,631,481, Cl. 324-320.000.

Lumbermate Company: *See—*
Eberle, George F.; Bickel, Karl L.; and Denny, John M., 4,630,424, Cl. 52-693.000.

Lush, Linda: *See—*
Braun, Hilarion; Lush, Linda; and Lehman, Scott, 4,631,549, Cl. 346-1.100.

Luszczek, John P.: *See—*
Brombal, David S.; Bunner, Charles B. D.; Gulis, Nickolas S.; and Luszczek, John P., 4,631,641, Cl. 361-424.000.

Lutz, Alfons: *See—*
Fuerst, Arpad; and Lutz, Alfons, 4,630,860, Cl. 296-217.000.

Lutz, Dieter, to SACHS-Systemtechnik GmbH. Method for manufacturing a cylinder unit for a cylinder piston combustion engine. 4,630,345, Cl. 29-156.4WL.

M. P. Iding Disc Grinding Compound Co., Inc.: *See—*
Iding, Joseph P., 4,630,408, Cl. 51-337.000.

Mabu-Pressen Maschinenfabrik Karl Burkard KG: *See—*
Koch, Elmar; and Gleich, Hermann, 4,630,516, Cl. 83-530.000.

Mabuchi, Akira; Yano, Kenji; and Mizuno, Hisashi, to Toyoda Gosei Co., Ltd. Method for curing polyurethane coating. 4,631,206, Cl. 427-340.000.

Machholz, Walter: *See—*
Diehl, Hermann; Baatz, Gunter; and Machholz, Walter, 4,630,421, Cl. 52-408.000.

Macrovision: *See—*
Ryan, John O., 4,631,603, Cl. 360-37.100.

Maeda, Hirofumi; Watanabe, Kazuyoshi; Akamatsu, Naruhiko; Senda, Kenichi; and Nishioka, Shunichi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method of aging expansion-molded body of polyolefin. 4,631,159, Cl. 264-53.000.

Maeda, Satoru, to Sony Corporation. System for text display with plural page memory and flag memory. 4,631,531, Cl. 340-701.000.

Magara, Takuji: *See—*
Fukunaga, Tokio; Magara, Takuji; Sakabe, Shigekazu; Aramaki, Jun; Karashima, Toshiharu; and Ushida, Minoru, 4,631,382, Cl. 219-69.00R.

Magarshack, John; and Pavlidis, Dimitri, to Thomson-CSF. Ultra high frequency power amplifier. 4,631,492, Cl. 330-277.000.

Magro, Sebastian. Insulated roll-up door. 4,630,664, Cl. 160-232.000.

Magyar Aluminiumipari Troszt: *See—*
Harsanyi, Jozsef; Pinter, Janos; and Suri, Alajos, 4,630,931, Cl. 366-107.000.

Maida, Osamu; and Saegusa, Takashi, to Nippon Kogaku K. K. Exposure control device of a camera. 4,630,917, Cl. 354-456.000.

Makek, James R.: *See—*
Blehm, Lynne; Makek, James R.; and White, W. Curtis, 4,631,273, Cl. 514-29.000.

Makimoto, Mitsuo; Endo, Haruyoshi; and Yamashita, Sadahiko, to Matsushita Electric Industrial Co., Ltd. Frequency-adjustable coaxial dielectric resonator and filter using the same. 4,631,506, Cl. 333-224.000.

Makino, Fusao: *See—*
Yoshida, Kunio; and Makino, Fusao, 4,630,947, Cl. 400-124.000.

Makita, Fujio: *See—*
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, 4,630,704, Cl. 180-247.000.

Maksymonko, George B.: *See—*
Brooke, Robert L.; McConnell, Peter J.; Testa, Anthony M.; and Maksymonko, George B., 4,630,470, Cl. 73-146.200.

Malavard, Lucien: *See—*
Cousteau, Jacques Y.; Malavard, Lucien; and Charrier, Bertrand, 4,630,997, Cl. 416-90.00A.

Malicki, Raymond W., to Carron & Company. Compression strain gauge transducer assembly. 4,630,490, Cl. 73-862.650.

Malka, Jacob H.; and Friedlander, Mordechai, to Allied Corporation. Multimode pulse generator. 4,631,484, Cl. 328-63.000.

Mallick, George T., Jr., to Westinghouse Electric Corp. Solenoid control circuit. 4,631,629, Cl. 361-154.000.

Mallinckrodt, Inc.: *See—*
Salpekar, Anil M.; and Johnson, John, 4,631,284, Cl. 514-277.000.

Malte Skoog Invent Ab: *See—*
Skoog, Malte, 4,630,674, Cl. 165-147.000.

Mandon, Jean-Pierre; and Rapiteau, Jean, to Airwick Industries, Inc. Dispenser for releasing a volatile active substance. 4,630,775, Cl. 239-56.000.

Mandrell, Richard J., to ACF Industries, Incorporated. Apparatus for restraining containers in a railway car. 4,630,981, Cl. 410-91.000.

Manesse, Jean-Pierre: *See—*
Peyre, Xavier M.; and Manesse, Jean-Pierre, 4,630,542, Cl. 104-114.000.

Mankedick, Robert G.: *See—*
Barnes, Lawrence C.; and Mankedick, Robert G., 4,631,588, Cl. 358-149.000.

Mannesmann AG: *See—*
Hecht, Joachim; and Rudat, Gerhard, 4,630,544, Cl. 105-130.000.
Kranz, Eckhard; and Duren, Karl, 4,630,351, Cl. 29-527.200.
von Hagen, Ingo; Hillenbrand, Hans-Georg; and Popperling, Rolf K., 4,631,095, Cl. 148-12.00F.

Manning, Howard J., to TI Domestic Appliances Limited. Off-peak electric liquid heating system employing regulatable heat pipe. 4,631,388, Cl. 219-326.000.

Manufacture de Machines du Haut-Rhin: *See—*
Rohmer, Daniel; and Scherrer, Alain, 4,630,341, Cl. 29-1.300.

Maraux, Jean. Carbureting device for an engine. 4,630,585, Cl. 123-438.000.

Marik, Charles J., to Motorola, Inc. Analog divider with minimal phase distortion. 4,631,745, Cl. 381-15.000.

Mark, Richard H., Jr., to Westinghouse Electric Corp. Display of eddy current detector data. 4,631,533, Cl. 340-721.000.

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Marks, Robert J., to Reliance Electric Company. Terminal pedestal for buried cable installation. 4,631,353, Cl. 174-16.00R.

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Martin, Frank D. Automatic urine detecting, collecting and storing device. 4,631,061, Cl. 604-318.000.

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Massaglia, Giovanni, to Jem Imports, Inc. Game employing top and platform. 4,630,822, Cl. 273-118.00A.

Massaro, Peter C.; and Legawiec, Ronald F., to Trol-Mation, Inc. Apparatus and method for pre-filling a hydraulic motor. 4,630,442, Cl. 60-415.000.

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Boni, Renato, 4,630,720, Cl. 192-48.800.

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Matsushita Electric Industrial Co., Ltd.: *See—*
Fujioka, Souichirou; Inaji, Toshio; and Yamamoto, Susumu, 4,631,459, Cl. 318-254.000.
Makimoto, Mitsuo; Endo, Haruyoshi; and Yamashita, Sadahiko, 4,631,506, Cl. 333-224.000.
Shibata, Tsuneo; Mohri, Yoshitaka; Ida, Haruo; and Ishikawa, Haruo, 4,631,024, Cl. 431-268.000.
Watanabe, Kainen; Yasuhara, Hiroto; Sugiyama, Toru; Shimizu, Keiji; and Murata, Yoshihiro, 4,630,772, Cl. 238-159.000.
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Horii, Sadashige, 4,630,933, Cl. 368-10.000.
Kitagawa, Yoshiaki; and Iwata, Hideo, 4,631,102, Cl. 156-210.000.
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Mauer, Dieter, to USM Corporation. Fastener-setting tool. 4,630,460, Cl. 72-391.000.
Maughan, William S.; and Fraenkel, Herbert, to Sortex Limited. Sorting machine utilizing an improved light detection system. 4,630,736, Cl. 209-587.000.
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May, William E.: *See—*
Alexander, James O.; King, William A.; May, William E.; and Pardue, Von G., 4,631,625, Cl. 361-94.000.
Mayer, Albert L., to Panavision, Inc. Apparatus for pivotally mounting a film magazine to a motion picture camera. 4,630,907, Cl. 352-75.000.
Mayes, M. Dale, to Dow Chemical Company, The. Temperature measuring apparatus. 4,630,939, Cl. 374-135.000.
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Hatamura, Koichi; and Hiraoka, Tetsuo, 4,630,575, Cl. 123-52.00M.
Mazumder, Nikhil C.; and Yee, David H. B., to Advanced Micro Devices, Inc. ECL gate circuit having internally generated reference voltages. 4,631,427, Cl. 307-455.000.
McCallister, John S., to Sim-Tech Limited. Attaching coaxially a member or fitting with a bore therethrough to a shaft. 4,630,958, Cl. 403-257.000.
McCann, Gerald, to McCann's Engineering & Manufacturing Company. Delayed action liquid level sensing apparatus. 4,631,375, Cl. 200-84.00C.
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McCarty, Frederick B., to Garrett Corporation, The. Consequent pole permanent magnet rotor. 4,631,435, Cl. 310-156.000.
McCollum, Patrick E.; Brownrigg, James K.; and Linder, Carl O., to Rockwell International Corporation. Isolated low power thyristor gate drive circuit. 4,631,472, Cl. 323-325.000.
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McCord, Herbert E. Deck drain by-pass plug. 4,630,648, Cl. 138-103.000.
McCormick, Daniel F., to Brunswick Corporation. Torque aided pulsed impact shift mechanism. 4,630,719, Cl. 192-21.000.
McCue, Robert J.; and Minter, Ronald H., to Chloride Systems, a division of Chloride Power Electronics, Incorporated. Plug-in emergency light fixture. 4,631,649, Cl. 362-183.000.
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McCullough, Francis P.; and Snelgrove, Roy V., to Dow Chemical Company, The. Low resistance collector frame for electroconductive organic, carbon and graphitic materials. 4,631,118, Cl. 204-16.000.
McDonald, Allen S.; Philp, Charles W.; and Sperakis, Thomas A., to Handy & Harman. Copper-zinc-manganese-nickel alloys. 4,631,171, Cl. 420-481.000.
McFarlane, Arthur H., to Morse Controls Limited. Seat recline unit. 4,630,866, Cl. 297-361.000.
McGee, Theodore W.; Muncy, Charles; and Suerth, John E., to McGee, Theodore W. Liquid-containing decorative device. 4,631,210, Cl. 428-13.000.
McGuire, William J. Dowell making. 4,630,660, Cl. 144-363.000.
McKenzie, Noel C.: *See—*
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McKinney, Benjamin F., to Oxide & Chemical Corporation. Rotary turntable furnace for litharge production. 4,631,026, Cl. 432-138.000.
McLaughlin, William L.: *See—*
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McLean, Joseph G. Articulated assembly of members. 4,630,509, Cl. 76-37.000.
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McQueen, Norman, to Otis Elevator Company. Bogie for cable-drawn vehicle. 4,630,543, Cl. 104-173.100.
Mead, Carver A.: *See—*
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Medlin, Michael A. Apparatus for producing patching material for filling potholes in paved surfaces. 4,630,929, Cl. 366-10.000.
Medtronic, Inc.: *See—*
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Menkes, Henry E.: *See—*
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Menne, Eugene P., to Johnson Fishing, Inc. Outboard motor foot control with adjustable cables. 4,631,033, Cl. 440-7.000.
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Sheffer, Phil B., 4,630,551, Cl. 108-159.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Praefcke, Klaus; Kohne, Bernd; Poules, Wadi; and Poetsch, Eike, 4,631,143, Cl. 252-299.620.
Meriwether, Jon D., to Follansbee Steel Corporation. Pipe flotation assembly. 4,631,039, Cl. 441-133.000.
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Metzeler Schaum GmbH: *See*—
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Lockhoff, Oswald; Kruger, Bernd-Wieland; Stadler, Peter; Metzger, Karl G.; Kroll, Hein-Peter; Schaller, Klaus; and Zeiler, Hans-Joachim, 4,631,272, Cl. 514-23.000.
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Meyerand, Mary E. Process and apparatus for generating electrical power from ocean waves. 4,630,440, Cl. 60-398.000.
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Moore, Marvin W., 4,630,877, Cl. 339-60.00M.
Middlebrook, Daryl L. Airframe and propulsion system. 4,630,787, Cl. 244-65.000.
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Miller, Stewart E., to Bell Communications Research, Inc. Low noise injection laser structure. 4,631,730, Cl. 372-50.000.
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Suuchi, Osamu; Mimaya, Shuzo; and Ohashi, Masaru, 4,630,779, Cl. 241-1.000.
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Clifton, Richard B., 4,631,220, Cl. 428-133.000.
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Sagawa, Burt K., 4,631,084, Cl. 106-21.000.
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Mitchell, Robert D., to Du Pont de Nemours, E. I., and Company. Process for preparation of liquid toners for electrostatic imaging using polar additive. 4,631,244, Cl. 430-137.000.
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Mitsuo, Hirofumi, to Fuji Photo Film Co., Ltd. Process of producing color developer sheet for pressure-sensitive recording. 4,631,204, Cl. 427-150.000.
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Miyaji, Kenichi; Toida, Shouji; Ito, Seiichi; Watanabe, Isao; and Kishida, Masatoshi, to Nippon Sanso Kabushiki Kaisha. Container and plug assembly. 4,630,742, Cl. 215-13.00R.
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Mizoguchi, Saburo, to Sharp Kabushiki Kaisha. Fiber optic level sensor for humidifier. 4,630,475, Cl. 73-293.000.
Mizuhara, Howard, to GTE Products Corporation. Method of brazing using a ductile low temperature brazing alloy. 4,630,767, Cl. 228-122.000.
Mizumoto, Mamoru; Yamashita, Hisao; Matsuda, Shinpei; and Yamaguchi, Kazuhiko, to Hitachi, Ltd. Water-repellent catalyst for gas/liquid reactions and process for gas/liquid reactions by using the same. 4,631,263, Cl. 502-159.000.
Mizuno, Hisashi: *See*—
Mabuchi, Akira; Yano, Kenji; and Mizuno, Hisashi, 4,631,206, Cl. 427-340.000.
Mizuno, Takehisa: *See*—
Hosoda, Atsushi; Miura, Yoshikiyo; Mizuno, Takehisa; and Morita, Tsuyoshi, 4,631,307, Cl. 524-269.000.

Mizuno, Toru; Nanba, Sinzi; Matsui, Kazuma; and Goto, Tsukasa, to Nippondenso Co., Ltd. Mass flowmeter. 4,630,484, Cl. 73-861.220.

Mizutani, Seiki; Hayashi, Mikio; and Ikeda, Kazuaki, to Seikosha Co., Ltd. Dot printer operable in high resolution and ordinary printing modes. 4,630,946, Cl. 400-121.000.

Mobil Oil Corporation: *See—*
Axelrod, Joan C.; and Chibnik, Sheldon, 4,631,071, Cl. 44-71.000.
Chew, Ju-Nam, 4,630,778, Cl. 241-1.000.
Lambert, James; and Rice, William E., 4,630,786, Cl. 242-96.000.

Mochizuki, Noritaka; and Minami, Setsuo, to Canon Kabushiki Kaisha. Compound eye optical system having a variable magnification function. 4,630,902, Cl. 350-570.000.

Mock, Edward A., to Garrett Corporation, The. Jet pump having pressure responsive motive fluid control valve. 4,631,004, Cl. 417-189.000.

Moehr, Robert, to Cross Company, The. Gib for machine tool. 4,630,944, Cl. 384-39.000.

Mohri, Yoshitaka: *See—*
Shibata, Tsuneo; Mohri, Yoshitaka; Ida, Haruo; and Ishikawa, Haruo, 4,631,024, Cl. 431-268.000.

Mommer, Richard P.; and Thomas, Johnny M., II, to Uniscope, Inc. Continuous-flow process for making a hardened animal feed composition. 4,631,192, Cl. 426-69.000.

Monkelbaan, Edwin R.: *See—*
Fantuzzo, Joseph; and Monkelbaan, Edwin R., 4,630,919, Cl. 355-4.000.

Monogram Industries, Inc.: *See—*
Belanger, Victor, 4,630,510, Cl. 81-55.000.

Montesi, Edward N., to Siebe North, Inc. Valve assembly for a replaceable filter respirator. 4,630,604, Cl. 128-206.150.

Moog Inc.: *See—*
Aubrecht, Richard A., 4,631,430, Cl. 310-12.000.

Moore, James H.: *See—*
Breedlove, Paul S.; Moore, James H.; Brantingham, George L.; and Wiggins, Richard H., Jr., 4,631,748, Cl. 381-51.000.

Moore, Marvin W., to Microdot Inc. Socket. 4,630,877, Cl. 339-60.00M.

Moore, Raymond, to Lucas Industries Public Limited Company. Liquid level gauge. 4,630,476, Cl. 73-293.000.

Mora, Camillo C., to Camillo Corvi S.p.A. (—) Campholenic acid ester of salicylic acid and pharmaceutically acceptable salts thereof having mucosecretolytic, anti-inflammatory, analgesic, and antipyretic activity. 4,631,293, Cl. 514-530.000.

Morgan, Ronald E. Impulse operated relay system. 4,631,627, Cl. 361-153.000.

Mori, Shinji: *See—*
Nishimura, Yuji; Mori, Shinji; and Kawaguchi, Teruhiko, 4,630,841, Cl. 280-806.000.

Morita, Tsuyoshi: *See—*
Hosoda, Atsushi; Miura, Yoshikiyo; Mizuno, Takehisa; and Morita, Tsuyoshi, 4,631,307, Cl. 524-269.000.

Morita, Yoshiyasu: *See—*
Fukui, Kunihiro; Nishihara, Minoru; Mase, Toshiro; Morita, Yoshiyasu; and Kawashima, Hisakazu, 4,630,849, Cl. 285-55.000.

Morizzo, Nicholas L., to Krantz America, Inc. Method and apparatus for inspecting a length of material. 4,630,339, Cl. 26-70.000.

Morrell, Albert M.; and Masterton, Walter D., to RCA Corporation. Color picture tube having improved line screen. 4,631,441, Cl. 313-408.000.

Morris, Joseph B.: *See—*
Landoll, Donald R.; Swart, Kyle D.; and Morris, Joseph B., 4,630,991, Cl. 414-478.000.

Morrison, Charles B.: *See—*
Goodwin, Frank E.; Law, Hsiang-Yi D.; Morrison, Charles B.; and Figueroa, Luis, 4,631,729, Cl. 372-44.000.

Morrison, Paul E.: *See—*
Christhilf, Harold H.; Morrison, Paul E.; and Niemczura, Paul W., 4,631,083, Cl. 106-14.230.

Morse Controls Limited: *See—*
McFarlane, Arthur H., 4,630,866, Cl. 297-361.000.

Mosch, Egon: *See—*
Bammert, Hubert; Lahres, Hans; and Mosch, Egon, 4,630,906, Cl. 351-159.000.

Motoren-und Turbinen Union Muchen GmbH: *See—*
Gross, Helmut, 4,630,994, Cl. 415-190.000.

Motorola, Inc.: *See—*
Abdala, Julio, Jr.; and Gasparaitis, Bernard V., 4,630,895, Cl. 350-345.000.
Birrittella, Mark S.; Reuss, Robert H.; and Seelbach, Walter C., 4,631,570, Cl. 357-49.000.
Borras, Jaime A.; and Suarez, Jose L., 4,631,496, Cl. 331-1.00A.
Davis, Walter L.; Prieto, Yolanda; and Smoot, George W., 4,631,737, Cl. 375-88.000.
DeFreese, Jeffrey A.; and Lind, Theodore E., 4,631,197, Cl. 427-10.000.
Kessler, Peter H.; Calvert, Wilson D., Sr.; and Pintchovski, Faivel S., 4,630,669, Cl. 165-1.000.
Laird, Kevin M.; and Rozanski, Walt, 4,631,489, Cl. 329-110.000.
Marik, Charles J., 4,631,745, Cl. 381-15.000.
Tichy, Thomas H., 4,630,342, Cl. 29-25.350.

Mott, Murray H.: *See—*
Prickett, Michael J.; Mott, Murray H.; and Panos, Nicholas, 4,631,541, Cl. 343-5.0DP.

Mrowka, Joseph J.: *See—*
Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., 4,631,634, Cl. 361-358.000.

MTU Motoren- und Turbinen-Union Muenchen GmbH: *See—*
Betz, Wolfgang, 4,630,995, Cl. 416-7.000.

Mueller, Otward M.; and Edelstein, William A., to General Electric Company. Low-noise RF preamplifier (especially for nuclear magnetic resonance system). 4,631,495, Cl. 330-310.000.

Mukai, Kunio: *See—*
Yamamoto, Haruyasu; Kasamatsu, Kiyoshi; Okabe, Takayuki; and Mukai, Kunio, 4,631,347, Cl. 260-963.000.

Mukasa, Shigeru: *See—*
Takamura, Moriyuki; Mukasa, Shigeru; and Ibi, Takashi, 4,631,725, Cl. 371-39.000.

Mulder, Douglas C.: *See—*
Hollstein, Thomas E.; Turner, James J.; Mulder, Douglas C.; and O'Ryan, David E., 4,630,777, Cl. 239-707.000.

Mulder, Hendrik: *See—*
Duinker, Simon; and Mulder, Hendrik, 4,630,607, Cl. 128-328.000.

Mulfarth, Werner, to Beloit Corporation. Machine for winding a web of paper on a roll. 4,630,783, Cl. 242-56.00A.

Mullen, George B.: *See—*
Georgiev, Vassil S.; and Mullen, George B., 4,631,340, Cl. 544-171.000.

Mullenix, Kenneth E.: *See—*
Troy, Seymour L.; and Mullenix, Kenneth E., 4,630,844, Cl. 283-67.000.

Muller, Eberhard, to Philipp Holzmann Aktiengesellschaft. Method and device for erecting building structures such as bridges, using pre-fabricated concrete beams. 4,630,798, Cl. 249-50.000.

Muller, Horst; and Deimel, Gerhard. Method of sterilizing packaging material, especially container-type packages. 4,631,173, Cl. 422-28.000.

Muller, Karl-Heinz; and Jordan, Alfons, to Uni-Cardan Aktiengesellschaft. Sealing assembly for universal joint. 4,630,834, Cl. 277-212.0FB.

Muller, Walter, to Ewikon Entwicklung und Konstruktion GmbH & Co.KG. Electrically operated heating element for a hot-runner tool. 4,631,389, Cl. 219-421.000.

Multifastener Corporation: *See—*
Woods, Harold T., 4,630,363, Cl. 29-798.000.

Mulvey, Dennis M.: *See—*
Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,631,283, Cl. 514-259.000.

Mumallah, Naim A.; Bruning, Donald D.; and Needham, Riley B., to Phillips Petroleum Company. In-situ formation of polyvalent metal ions for crosslinking polymers within carbonate rock-containing reservoirs. 4,630,678, Cl. 166-281.000.

Munck, Lars: *See—*
Jensen, Svend A. K.; Munck, Lars; Sigsgaard, Poul; and Huss, Hans H., 4,631,413, Cl. 250-458.100.

Muncy, Charles: *See—*
McGee, Theodore W.; Muncy, Charles; and Suerth, John E., 4,631,210, Cl. 428-13.000.

Mundy, Paul: *See—*
Twist, Michael; and Mundy, Paul, 4,630,848, Cl. 285-308.000.

Munkel, Albert: *See—*
Dietz, Erwin; Munkel, Albert; Hafner, Otmar; Rieper, Wolfgang; and Kroh, Adolf, 4,631,330, Cl. 528-49.000.

Murakami, Kakuji: *See—*
Kawanishi, Toshiyuki; Shimada, Masaru; Murakami, Kakuji; Aruga, Tamotsu; and Uemura, Hiroyuki, 4,631,085, Cl. 106-22.000.

Muralidhara, Ranya: *See—*
Courtney, Thomas F., Jr.; Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; and Wiener, Charles, 4,631,194, Cl. 426-535.000.

Murata, Yoshihiro: *See—*
Watanabe, Kainen; Yasuhara, Hiroto; Sugiyama, Toru; Shimizu, Keiji; and Murata, Yoshihiro, 4,630,772, Cl. 238-159.000.

Murray, Gary P., to Robinair Division. Compact vacuum pump. 4,631,006, Cl. 417-234.000.

Murray, Thomas L., Jr.: *See—*
Siwik, James C.; Murray, Thomas L., Jr.; and Holtey, Thomas O., 4,631,699, Cl. 364-900.000.

Murtland, James B., Jr. Thermistor liquid-level sensing probe. 4,630,477, Cl. 73-295.000.

Mutoh, Masayuki, to Minolta Camera Kabushiki Kaisha. Liquid tank. 4,630,758, Cl. 222-189.000.

Nadagawa Corrosion Protecting Co., Ltd.: *See—*
Yamamoto, Ikuo; Umino, Takehito; Shinoda, Yoshio; and Yoshino, Hisao, 4,631,172, Cl. 420-541.000.

Naete, Hidehiko: *See—*
Teshima, Tohru; Naete, Hidehiko; and Robert, Pierre H., 4,631,513, Cl. 340-52.00R.

Nagao, Yasuhiro: *See—*
Asaoka, Ryuji; and Nagao, Yasuhiro, 4,631,434, Cl. 310-112.000.

Nagarkatti, Ashok; Lordo, Robert E.; and Kind, Burkhart, to Powerton, division of Contraves Goerz Corporation. Harmonically graded airgap reluctance-type rotating electric resolver. 4,631,510, Cl. 336-135.000.

Nagasaki, Katsuhiko: *See—*
Uchida, Rokuroh; Nagasaki, Katsuhiko; Miyake, Yasunori; Ohno, Michio; Takeichi, Hitoshi; and Matsumoto, Hiroji, 4,630,612, Cl. 128-660.000.

Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, to Olympus Optical Co., Ltd. Endoscope using solid state image pick-up device. 4,631,582, Cl. 358-98.000.

Nagashima, Akira, to Kioritz Corporation. Front handle support means of portable chain saw. 4,630,372, Cl. 30-381.000.

Nagata, Osamu: *See—*
Sagawa, Ryuichi; Nagata, Osamu; and Kajima, Takashi, 4,630,588, Cl. 123-506.000.

Nagatomo, Katsuaki: *See—*
Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hironobu; Omoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, 4,631,106, Cl. 156-345.000.

Nagatsuma, Kazuyuki; Takagi, Kazumasa; and Matsumura, Hiroyoshi, to Hitachi, Ltd.; and Hitachi Cable, Ltd. Optical electric-field measuring apparatus. 4,631,402, Cl. 250-231.00R.

Nagele, Erwin: *See—*
Biermann, Eberhard; Nagele, Erwin; and Romann, Peter, 4,630,487, Cl. 73-861.760.

Nahmaschinenfabrik Emil Stutznacker GmbH & Co. KG: *See—*
Stutznacker, Klaus, 4,630,560, Cl. 112-302.000.

Nakahama, Ryoji, to Sanshin Kogyo Kabushiki Kaisha. Hydraulic tilt device for marine propulsion unit. 4,631,035, Cl. 440-61.000.

Nakajima, Motoki: *See—*
Matsumoto, Kiyoshi; Fujikura, Yoshiaki; and Nakajima, Motoki, 4,631,147, Cl. 252-522.00R.

Nakamura, Hitoshi: *See—*
Shiiki, Kazuo; Shiroishi, Yoshihiro; Yuito, Isamu; Shinagawa, Kiminari; Uesaka, Yasutaro; Fujiwara, Hideo; and Nakamura, Hitoshi, 4,631,612, Cl. 360-125.000.

Nakamura, Kenji. Toilet article. 4,631,227, Cl. 428-283.000.

Nakamura, Koki: *See—*
Mifune, Hiroyuki; Nakamura, Koki; and Ishiguro, Shoji, 4,631,253, Cl. 430-569.000.

Nakamura, Masaru: *See—*
Yamabe, Masaaki; Kobayashi, Shigeyoshi; Yoshihara, Noriyuki; and Nakamura, Masaru, 4,631,075, Cl. 55-158.000.

Nakamura, Mutsuaki: *See—*
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,631,717, Cl. 369-276.000.

Nakano, Walter: *See—*
Chang, Richard; and Nakano, Walter, 4,631,041, Cl. 446-233.000.

Nakashima, Yoshihiro: *See—*
Fukuyama, Hiroomi; Hattori, Kiyoshi; and Nakashima, Yoshihiro, 4,631,465, Cl. 318-565.000.

Nakata, Takeshi, to Sanyo Electric Co., Ltd. Infrared ray detector. 4,631,406, Cl. 250-338.000.

Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hironobu; Omoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, to Hitachi, Ltd. Plasma processor. 4,631,106, Cl. 156-345.000.

Nalbone, Robert D.: *See—*
Coyne, Joan H.; Dooling, David J.; Miller, Louis E.; and Nalbone, Robert D., 4,631,364, Cl. 379-164.000.

Nally, Rickard P.: *See—*
Petersen, Borge; and Nally, Rickard P., 4,630,815, Cl. 271-273.000.

Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, to Victor Company of Japan, Ltd.; and Tokuyama Sekisui Industry Corporation, Limited. High density information records of an electrostatic capacitance type. 4,631,717, Cl. 369-276.000.

Nanba, Sinzi: *See—*
Mizuno, Toru; Nanba, Sinzi; Matsui, Kazuma; and Goto, Tsukasa, 4,630,484, Cl. 73-861.220.

Nasatka, Ralph G. Portable vehicle barricade or portable maximum security barrier. 4,630,395, Cl. 49-49.000.

Natarajan, Bangalore R.: *See—*
Opfer, James E.; and Natarajan, Bangalore R., 4,631,202, Cl. 427-131.000.

National Gypsum Company: *See—*
Kossuth, Donald A., 4,631,097, Cl. 156-44.000.

National Research Development Corporation: *See—*
Ahmed, Israr; Adams, Gerald E.; Stratford, Ian J.; and Gibson, David, 4,631,289, Cl. 514-397.000.
Hooper, Bernard, 4,630,591, Cl. 123-65.00S.

National Savings & Finance Corp. (Proprietary) Limited, The: *See—*
Pretorius, David J., 4,630,537, Cl. 101-3.00R.

National Semiconductor Corporation: *See—*
Single, Peter S., 4,631,694, Cl. 364-608.000.

National Starch and Chemical Corporation: *See—*
Jones, Larry D., 4,631,132, Cl. 210-727.000.

Naumann, Rolf; Leitner, Lutz; Rademachers, Jakob; and Buxbaum, Gunter, to Bayer Aktiengesellschaft. Preparation and use of iron magnetic pigments. 4,631,090, Cl. 106-304.000.

Naumann, Rolf: *See—*
Rademachers, Jakob; Naumann, Rolf; and Teichmann, Gunther, 4,631,089, Cl. 106-304.000.

Nawata, Makoto: *See—*
Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hironobu; Omoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, 4,631,106, Cl. 156-345.000.

Naylor, Herbert C.; Smith, Gregory J.; and Roeser, Howard J., Jr., to Reed Devices, Inc. Low profile screw terminal block with split plastic barrel. 4,630,882, Cl. 339-198.00R.

NCR Corporation: *See—*
Barnes, Lawrence C.; and Mankedick, Robert G., 4,631,588, Cl. 358-149.000.
Kappeler, Ronald P.; and Hughes, Robert C., 4,631,701, Cl. 364-900.000.
Petersen, Borge; and Nally, Rickard P., 4,630,815, Cl. 271-273.000.
Rogers, Steven H.; and Hwang, Thomas J., 4,630,357, Cl. 29-590.000.

Neal, Archie E.: *See—*
Love, John E.; Neal, Archie E.; and Libby, Scott, 4,630,432, Cl. 56-220.000.

NEC: *See—*
Koshimaru, Shigeru, 4,631,425, Cl. 307-449.000.

NEC Corporation: *See—*
Honda, Masahiko, 4,631,705, Cl. 365-182.000.
Horikawa, Akinori, 4,631,669, Cl. 364-200.000.
Ono, Tatsuhiro; Koike, Shin'ichi; Tsuchiya, Haruhiko; and Inoue, Yuji, 4,631,721, Cl. 370-85.000.
Tsubokura, Fusao, 4,631,571, Cl. 357-68.000.
Watanabe, Takayuki, 4,631,707, Cl. 365-226.000.
Yoshida, Yasuharu, 4,631,488, Cl. 329-50.000.

Needham, Riley B.: *See—*
Mumallah, Naim A.; Bruning, Donald D.; and Needham, Riley B., 4,630,678, Cl. 166-281.000.

Neilson, John M. S.; Wheatley, Carl F., Jr.; and Brackelmanns, Norbert W., to RCA Corporation. Gate shield structure for power MOS device. 4,631,564, Cl. 357-23.400.

Neipling, Lawrence E.; and Flohr, Mark C., to Smith International Inc. Drilling choke pressure limiting control system. 4,630,675, Cl. 166-53.000.

Nelson, Alan E.: *See—*
Bernstein, Robert E.; and Nelson, Alan E., 4,630,635, Cl. 137-315.000.

Nelson, Bertel S., to Wedgtrac Corporation. Tapered worm. 4,630,497, Cl. 74-425.000.

Nelson, Roderick D.; and Vu, Tho T., to Honeywell Inc. Digital circuit using MESFETS. 4,631,426, Cl. 307-450.000.

Neri, Armando, to G.D. Societa per Azioni. System for monitoring the operation of output transducers of a central control and monitoring unit for machines and/or devices usable in production and/or product packaging lines. 4,631,693, Cl. 364-550.000.

Neumaier, Anton: *See—*
Hunger, Josef; and Neumaier, Anton, 4,630,836, Cl. 279-19.000.

Neuman, Eli: *See—*
Davis, C. Paul; and Neuman, Eli, 4,631,614, Cl. 360-128.000.

Neuner, James A.; Boomgaard, Dirk J.; Wilbur, Susan A.; and Geis, Charles G., to Westinghouse Electric Corp. Method for temperature compensating a rod position indication system. 4,631,537, Cl. 340-870.170.

Newbould, Richard T.: *See—*
Tomlinson, Paul G.; and Newbould, Richard T., 4,631,078, Cl. 65-3.110.

Newcome, Thomas W., III; and Kartarik, Mark H. Device and method for article storage and release. 4,631,358, Cl. 379-45.000.

Newman, Ray L.: *See—*
Ferri, John L.; Fulkerson, William C.; Newman, Ray L.; and Gonzalez, Jeffrey M., 4,631,022, Cl. 431-90.000.

Newton, Robert E.; and Girgenti, Russell S., to Auburn International, Inc. Dust flow inducing monitor. 4,631,482, Cl. 324-454.000.

Ng, David T.; and Brendemuehl, Roger C., to Beloit Corporation. Method and apparatus for controlling a winder for stop-to-length or stop-to-roll diameter. 4,631,682, Cl. 364-471.000.

Nguyen, Hung T.; Dang, Vu Q.; Duval, Henry H., Jr.; and Kennedy, Donald J., to Cleanseal Systems, Inc. Apparatus for sealing pavement seams. 4,630,965, Cl. 404-107.000.

Nickel, Bernd; and Schorr, Wolfgang, to Siemens Aktiengesellschaft. Method for eliminating spurious signals in a measuring installation for identifying the position of a rigid body in space. 4,631,477, Cl. 324-207.000.

Nickles, Robert J., to Wisconsin Alumni Research Foundation. Method and apparatus for measurement of radioactivity over an extended range. 4,631,410, Cl. 250-363.00R.

Nicol, David A.: *See—*
Clark, Harold R.; and Nicol, David A., 4,631,079, Cl. 65-109.000.

Nielsen, Anker J., Jr., to Inner-Tite Corporation. Casket lock for valve assembly. 4,630,456, Cl. 70-232.000.

Niemczura, Paul W.: *See—*
Christhilf, Harold H.; Morrison, Paul E.; and Niemczura, Paul W., 4,631,083, Cl. 106-14.230.

Niepoth, George W.: *See—*
Armstrong, Donald J.; Giacomazzi, Roy A.; and Niepoth, George W., 4,630,749, Cl. 220-86.00R.

Nii, Tomio, to Tokyo Juki Industrial Co., Ltd. Ink ribbon and correction tape lifting mechanism for a typewriter. 4,630,951, Cl. 400-697.100.

Nilssen, Ole K. Modular suspended ceiling and lighting system. 4,631,648, Cl. 362-150.000.

Nilsson, Claes T.: *See—*
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,631,163, Cl. 264-291.000.

Nimberger, Spencer M., to General Screw Products Company. Valve with compressible valve stem and valve body seals. 4,630,629, Cl. 137-15.000.

Nippon Acchakutanshi Seizo Kabushiki Kaisha: *See—*
Okazaki, Takashi; Matsu'ura, Yukio; and Saijo, Yoshihiko, 4,630,353, Cl. 29-564.400.

Nippon Air Brake Co., Ltd.: *See—*
Fujiwara, Tatsuo, 4,631,514, Cl. 340-52.00R.

Nippon Cable System Inc.: *See—*
Suzuki, Kazuhiro, 4,630,500, Cl. 74-473.00R.

Nippon Electric Co., Ltd.: *See—*
Miyagi, Isamu, 4,631,424, Cl. 307-448.000.
Umetsu, Shinjiro; and Oyamada, Takashi, 4,631,640, Cl. 361-422.000.

Nippon Kogaku K. K.: *See—*
Maida, Osamu; and Saegusa, Takashi, 4,630,917, Cl. 354-456.000.

Nippon Mining Co., Ltd.: *See—*
Suuchi, Osamu; Mimaya, Shuzo; and Ohashi, Masaru, 4,630,779, Cl. 241-1.000.

Nippon Oil & Fars Co., Ltd.: *See—*
Kobayashi, Michio; Yoshida, Masato; Sawada, Hideo; Hagii, Hidehiko; and Aoshima, Kazuyoshi, 4,631,151, Cl. 260-408.000.

Nippon Petrochemicals Company, Limited: *See—*
Kano, Masafumi; Tanaka, Megumu; Sato, Atsushi; and Kawakami, Shigenobu, 4,631,632, Cl. 361-315.000.

Nippon Sanso Kabushiki Kaisha: *See—*
Miyaji, Kenichi; Toida, Shouji; Ito, Seiichi; Watanabe, Isao; and Kishida, Masatoshi, 4,630,742, Cl. 215-13.00R.

Nippon Soken, Inc.: *See—*
Yamanoue, Kouichi; and Kitagawa, Junji, 4,631,736, Cl. 375-71.000.

Nippon Steel Chemical Co., Ltd.: *See—*
Matsumoto, Mitsuaki; Furuyama, Masatosi; Tomioka, Tadao; Sunago, Hirofumi; and Higuchi, Masakazu, 4,631,181, Cl. 423-449.000.

Nippon Steel Corporation: *See—*
Matsumoto, Mitsuaki; Furuyama, Masatosi; Tomioka, Tadao; Sunago, Hirofumi; and Higuchi, Masakazu, 4,631,181, Cl. 423-449.000.

Nippon Telegraph & Telephone Public Corporation: *See—*
Ono, Tatsuhiro; Koike, Shin'ichi; Tsuchiya, Haruhiko; and Inoue, Yuji, 4,631,721, Cl. 370-85.000.

Nippon Univac Kaisha, Ltd.: *See—*
Honda, Masamitsu, 4,631,473, Cl. 324-72.500.

Nippondenso Co., Ltd.: *See—*
Asaoka, Ryuji; and Nagao, Yasuhiro, 4,631,434, Cl. 310-112.000.
Imoto, Yuzo; Wakata, Hideo; Takei, Toshihiro; Hattori, Yoshiyuki; and Nomura, Yoshihisa, 4,630,871, Cl. 303-113.000.
Mizuno, Toru; Nanba, Sinzi; Matsui, Kazuma; and Goto, Tsukasa, 4,630,484, Cl. 73-861.220.

Nishida, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Engine exhaust apparatus for water-jet propulsion boat. 4,631,032, Cl. 440-47.000.

Nishigaki, Susumu; Ohkoshi, Akio; and Aozuka, Torao, to Sony Corporation. Golf club head. 4,630,826, Cl. 273-167.00H.

Nishihara, Minoru: *See—*
Fukui, Kunihiro; Nishihara, Minoru; Mase, Toshiro; Morita, Yoshiyasu; and Kawashima, Hisakazu, 4,630,849, Cl. 285-55.000.

Nishii, Michiharu, to Aisin Seiki Kabushiki Kaisha. Vacuum booster assembly. 4,630,525, Cl. 91-369.00A.

Nishikawa, Satoshi: *See—*
Kakinuma, Hiroaki; Nishikawa, Satoshi; and Watanabe, Tsukasa, 4,631,198, Cl. 427-38.000.

Nishimura, Akira, to Sumitomo Electric Industries, Ltd. Rubberized fabric. 4,631,225, Cl. 428-250.000.

Nishimura, Yuji; Mori, Shinji; and Kawaguchi, Teruhiko, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Webbing tension adjusting apparatus. 4,630,841, Cl. 280-806.000.

Nishino, Yoshinori; Yamamoto, Masahiko; Uda, Tadayoshi; and Kanazawa, Tomoyoshi, to Hitachi Zosen Corporation. Pipe joint. 4,630,846, Cl. 285-21.000.

Nishioka, Shunichi: *See—*
Maeda, Hirofumi; Watanabe, Kazuyoshi; Akamatsu, Naruhiko; Senda, Kenichi; and Nishioka, Shunichi, 4,631,159, Cl. 264-53.000.

Nishiyama, Yoshinobu: *See—*
Yotsuyanagi, Takao; and Nishiyama, Yoshinobu, 4,631,177, Cl. 423-112.000.

Nishizawa, Jun-ichi, to Fuji Photo Film Co., Ltd. Semiconductor image sensor. 4,631,592, Cl. 358-213.000.

Nissan Motor Co., Ltd.: *See—*
Higashiyama, Kazuhiro; and Ishigami, Kazuhiro, 4,630,584, Cl. 123-425.000.
Hirano, Yoshinori, 4,630,574, Cl. 123-41.270.
Ogawa, Naoki; Kubozuka, Takao; and Hirano, Yoshinori, 4,630,573, Cl. 123-41.270.
Shinzawa, Motohiro, 4,630,438, Cl. 60-274.000.
Suzuki, Mikio; and Yamazaki, Masafumi, 4,630,583, Cl. 123-425.000.
Yukawa, Shinjiro, 4,630,707, Cl. 181-288.000.

Nitto Electric Industrial Co., Ltd.: *See—*
Ametani, Minoru, 4,631,103, Cl. 156-241.000.
Tsumura, Akio; Hayashi, Shun-ichi; Miyaake, Chiharu; Oouchi, Kazuo; and Yamamura, Yutaka, 4,631,110, Cl. 156-584.000.

Noback, Charles V., to Nuclear Research Corp. Radiation measuring apparatus and method. 4,631,411, Cl. 250-374.000.

Nobesawa, Shigeru, to Jelco. Co., Ltd. Push button switch. 4,631,378, Cl. 200-340.000.

Noguchi, Tsutomu: *See—*
Tomimasu, Takio; Noguchi, Tsutomu; Tanino, Hiroshi; and Sugiyama, Suguru, 4,631,743, Cl. 378-138.000.

Nolan, John H.; and Nolan, William A. Remotely controlled override valve with calibration means. 4,630,799, Cl. 251-129.180.

Nolan, William A.: *See—*
Nolan, John H.; and Nolan, William A., 4,630,799, Cl. 251-129.180.

Nomura, Yoshihisa: *See—*
Imoto, Yuzo; Wakata, Hideo; Takei, Toshihiro; Hattori, Yoshiyuki; and Nomura, Yoshihisa, 4,630,871, Cl. 303-113.000.

Nonoyama, Hideki: *See—*
Ozawa, Kazuo; and Nonoyama, Hideki, 4,631,618, Cl. 360-132.000.

Noonan, Joseph F.: *See—*
Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., 4,631,634, Cl. 361-358.000.

Nootenboom, Peter: *See—*
Oudejans, Johannes C.; Nootenboom, Peter; Ganguli, Keshab L.; and Lok, Cornelis M., 4,631,265, Cl. 502-259.000.

Nordischer Maschinenbau Rud.: *See—*
Evers, Reinhard; and Wenzel, Werner, 4,630,334, Cl. 17-56.000.

Nordisk Ventilator Co.: *See—*
Jensen, Carl E., 4,630,993, Cl. 415-53.00R.

Nordlie, Lawrence A.: *See—*
Lachman, Irwin M.; and Nordlie, Lawrence A., 4,631,267, Cl. 502-439.000.
Lachman, Irwin M.; Bardhan, Pronob; and Nordlie, Lawrence A., 4,631,268, Cl. 502-439.000.
Lachman, Irwin M.; and Nordlie, Lawrence A., 4,631,269, Cl. 502-439.000.

Nordson Corporation: *See—*
Hollstein, Thomas E.; Turner, James J.; Mulder, Douglas C.; and O'Ryan, David E., 4,630,777, Cl. 239-707.000.
Rehman, William R.; and Smith, James C., 4,630,774, Cl. 239-8.000.

Normand, Randall J.: *See—*
Akers, James B., Jr.; Leng, Douglas E.; and Normand, Randall J., 4,631,175, Cl. 422-135.000.

Norsk Hydro a.s: *See—*
Wold, Johnny; and Kristiansen, Leif A., 4,631,266, Cl. 502-324.000.

North American Philips Consumer Electronics Corp.: *See—*
Robbins, John D., 4,631,440, Cl. 313-403.000.

North American Philips Corporation: *See—*
Shaulov, Avner A.; Lukasik, Stanley J.; Frommer, Myron H.; and Zwicker, Walter K., 4,631,633, Cl. 361-321.000.

North American Philips Lighting Corporation: *See—*
Lagree, James L.; and Elms, Robert T., 4,631,450, Cl. 315-244.000.

Northern Telecom Limited: *See—*
Brombal, David S.; Bunner, Charles B. D.; Gulis, Nickolas S.; and Luszczek, John P., 4,631,641, Cl. 361-424.000.

Northrop Corporation: *See—*
Haavisto, John R., 4,630,885, Cl. 350-96.150.
Paul, Mark O., 4,631,583, Cl. 358-125.000.

Novak, John W., Jr.; Raines, Dennis R.; and Bray, Donald J., to Aluminum Company of America. Bonding aluminum to refractory materials. 4,630,665, Cl. 164-97.000.

Nowak, Ronald J.: *See—*
Burkhardt, Norman S.; Richard, Maureen M.; Buxton, Forrest T.; and Nowak, Ronald J., 4,631,598, Cl. 358-280.000.

Nowak, Rudolf: *See—*
Stockhausen, Dolf; Nowak, Rudolf; Chmelir, Miroslav; Kaussen, Manfred; and Dahmen, Kurt, 4,631,063, Cl. ∂-94.210.

Nozaki, Nobuharu: *See—*
Kawajiri, Kazuhiro; Sunagawa, Hiroshi; Nozaki, Nobuharu; Hosoi, Yuichi; and Takahashi, Kenji, 4,631,407, Cl. 250-327.200.

Nuclear Research Corp.: *See—*
Noback, Charles V., 4,631,411, Cl. 250-374.000.

Null, Robert A.; Laughlin, Lonnie C.; and Goldberg, Michael L., to Wilkerson Corporation. Method and apparatus for theadsorptive fractionation of gases. 4,631,073, Cl. 55-18.000.

Nusser, Hermann; and Peters, Klaus-Jurgen, to Robert Bosch GmbH. Apparatus for controlling the position of a throttle device disposed in the intake tube of an internal combustion engine. 4,630,578, Cl. 123-179.00G.

N.V. Optische Industrie "De Oude Delft" : *See—*
Duinker, Simon; and Mulder, Hendrik, 4,630,607, Cl. 128-328.000.

O&K Orenstein & Koppel Aktiengesellschaft: *See—*
Heine, Franz; and Ruttershoff, Heinz-Joachim, 4,630,878, Cl. 339-75.00M.

O. Ruben Pettersson: *See—*
Bell, L. James, 4,630,853, Cl. 292-258.000.

Obama, Masao: *See—*
Arimura, Yoshiaki; Obama, Masao; and Hitomi, Yutaka, 4,631,689, Cl. 364-513.000.

Obradovich, George. Versatile router guide apparatus. 4,630,657, Cl. 144-144.5GT.

O'Brien, Michael T.; Sopory, Umesh K.; and Fang, Shou-Mean, to Raychem Corporation. Flexible high temperature heater. 4,631,392, Cl. 219-549.000.

Ochiai, Masahiko, to Kyushu Hitachi Maxell, Ltd. Push-button switch locking device for use in electric appliance. 4,631,373, Cl. 200-43.170.

Ochsner, Rolf H.; and Everett, Charles J., to Robert Shaw Controls Company. Method of making differential pressure operated electrical switch. 4,630,360, Cl. 29-622.000.

Odaka, Toshiko: *See—*
Tanaka, Katsuyuki; Terashima, Seiichiroo; Takeuchi, Yoshinori; Odaka, Toshiko; and Saito, Yokuo, 4,630,926, Cl. 356-357.000.

O'Dell, Lawrence W.: *See—*
Taube, John; O'Dell, Lawrence W.; and O'Dell, Michael D., 4,631,580, Cl. 358-88.000.

O'Dell, Michael D.: *See—*
Taube, John; O'Dell, Lawrence W.; and O'Dell, Michael D., 4,631,580, Cl. 358-88.000.

O'Driscoll, Peter F., to United States of America, Air Force. Method of constructing a dome restraint assembly for rocket motors. 4,631,154, Cl. 264-3.100.

Oertel, Hans W.: *See—*
deSouza, Alwyn A.; and Oertel, Hans W., 4,631,453, Cl. 315-340.000.

Ogata, Masamitsu: *See—*
Sato, Goro; Ogata, Masamitsu; and Ida, Takanori, 4,631,261, Cl. 502-65.000.

Ogawa, Mutsuo, to Ricoh Company, Ltd. Video data transmission apparatus. 4,631,597, Cl. 358-258.000.

Ogawa, Naoki; Kubozuka, Takao; and Hirano, Yoshinori, to Nissan Motor Co., Ltd. Cooling system for automotive engine or the like. 4,630,573, Cl. 123-41.270.

Ogawa, Susumu, to Fujikin International, Inc. Pipe couplings. 4,630,851, Cl. 285-341.000.

Ogawa, Takatoshi: *See—*
Ohnishi, Keizo; and Ogawa, Takatoshi, 4,631,170, Cl. 420-455.000.

Ogino, Toru: *See—*
Tamba, Shinichi; Ogino, Toru; and Fukui, Noboru, 4,631,153, Cl. 261-52.000.

Ogura, Eiji: *See—*
Umemoto, Teruo; and Ogura, Eiji, 4,631,342, Cl. 544-313.000.

Ogura, Shinji: *See—*
Horie, Motonobu; Suzuki, Minoru; and Ogura, Shinji, 4,630,724, Cl. 198-399.000.

O'Gwynn, David C., to Ampex Corporation. Multiple speed scanner servo system for protecting the heads and tape of helical recorders. 4,631,605, Cl. 360-70.000.

Ohashi, Masaru: *See—*
Suuchi, Osamu; Mimaya, Shuzo; and Ohashi, Masaru, 4,630,779, Cl. 241-1.000.

Ohashi, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Distributor for an internal combustion engine. 4,631,369, Cl. 200-19.00R.

Ohkoshi, Akio: *See—*
Nishigaki, Susumu; Ohkoshi, Akio; and Aozuka, Torao, 4,630,826, Cl. 273-167.00H.

Ohkuma, Hiroaki: *See—*
Koshiyama, Hideo; Sakai, Fumihide; and Ohkuma, Hiroaki, 4,631,256, Cl. 435-68.000.

Ohmori, Shunji; Takenaka, Hiroyuki; Hozoji, Akira; Kono, Kazunori; Yoshikawa, Kiyomitsu; and Kajihara, Seishi, to Mitsubishi Jukogyo Kabushiki Kaisha. Rotary drum shear. 4,630,514, Cl. 83-342.000.

Ohnishi, Keizo; and Ogawa, Takatoshi, to Japan Steel Works, Ltd., The. Calcium-nickel-misch metal-aluminum quaternary alloy for hydrogen storage. 4,631,170, Cl. 420-455.000.

Ohno, Michio: *See—*
Uchida, Rokuroh; Nagasaki, Katsuhiko; Miyake, Yasunori; Ohno, Michio; Takeichi, Hitoshi; and Matsumoto, Hiroji, 4,630,612, Cl. 128-660.000.

Ohsato, Kiyoshi; and Kubota, Shigeo, to Sony Corporation. Focussing error detecting apparatus employing a composite lens. 4,631,397, Cl. 250-201.000.

Ohwaki, Shinji: *See—*
Yoshimoto, Masato; and Ohwaki, Shinji, 4,631,162, Cl. 264-167.000.

Oishi, Kengo; and Katagiri, Shingo, to Fuji Photo Film Co., Ltd. Magnetic disk cartridge. 4,631,620, Cl. 360-133.000.

Okabe, Takayuki: *See—*
Yamamoto, Haruyasu; Kasamatsu, Kiyoshi; Okabe, Takayuki; and Mukai, Kunio, 4,631,347, Cl. 260-963.000.

Okamoto, Arifumi: *See—*
Yano, Tadashi; and Okamoto, Arifumi, 4,630,812, Cl. 271-132.000.

Okamura, Masatoshi: *See—*
Hashizume, Kenji; Shiba, Haruo; and Okamura, Masatoshi, 4,631,619, Cl. 360-132.000.

Okazaki, Haruo: *See—*
Hashimoto, Kunio, 4,630,726, Cl. 198-819.000.

Okazaki, Takashi; Matsu'ura, Yukio; and Saijo, Yoshihiko, to Nippon Acchakutanshi Seizo Kabushiki Kaisha. Insulation covering stripping device. 4,630,353, Cl. 29-564.400.

Oki Electric Industry Co., Ltd.: *See—*
Kakinuma, Hiroaki; Nishikawa, Satoshi; and Watanabe, Tsukasa, 4,631,198, Cl. 427-38.000.
Tanuma, Jiro; Uchida, Takao; and Hayashi, Kunihal, 4,631,457, Cl. 318-254.000.
Yokouchi, Hiroshi, 4,631,665, Cl. 364-200.000.

Oku, Toshio, to Kabushiki Kaisha Machida Seisakusho. Guide tube for industrial endoscope. 4,630,649, Cl. 138-122.000.

Okumoto, Gordon. Security clip for a louver panel. 4,630,399, Cl. 49-403.000.

Olak, Richard: *See—*
Wickmann, John T.; and Olak, Richard, 4,630,379, Cl. 33-288.000.

Olifant, Jacques: *See—*
Guery, Jean-Pierre; Gashet, Gerald; Olifant, Jacques; and Plumeret, Raymond, 4,631,507, Cl. 335-27.000.

Olin Corporation: *See—*
Gasper, Kenneth E., 4,631,530, Cl. 340-679.000.

Olin Hunt Specialty Products Inc.: *See—*
Minten, Karl L.; Battisti, Angelo J.; and Pismennaya, Galina, 4,631,117, Cl. 204-15.000.

Olioso, Silvio, to Index S.p.A. Technologie Impereabili. Equipment for uniformly spreading anti-sticking powders on bituminous membranes for building coverings. 4,630,565, Cl. 118-47.000.

Oliver, David W., to General Electric Company. Electronic control of rotating anode microfocus x-ray tubes for anode life extension. 4,631,742, Cl. 378-113.000.

Olofsson, Stig. Large-surface area control panel. 4,631,216, Cl. 428-106.000.

Olofsson, Stig. Wooden base plate. 4,631,218, Cl. 428-131.000.

Olsen, Cathryn E.: *See—*
Webb, Jimmy L.; and Olsen, Cathryn E., 4,631,346, Cl. 556-420.000.

Olson, Raymond G., to Baxter Travenol Laboratories, Inc. Pressure pump having jaws and end-slots. 4,631,007, Cl. 417-476.000.

Olsson, Karl-Erik, to Asea Aktiebolag. Mounting for electrical converter valve assembly. 4,631,656, Cl. 363-123.000.

Olympus Optical Co., Ltd.: *See—*
Horikawa, Yoshiaki, 4,631,394, Cl. 250-201.000.
Matsubayashi, Nobuhide; Kenjyo, Hideyuki; Kato, Kiichi; and Sakamoto, Masaharu, 4,631,712, Cl. 369-44.000.
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,631,582, Cl. 358-98.000.

Omoto, Yutaka: *See—*
Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hironobu; Omoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, 4,631,106, Cl. 156-345.000.

Omura, Takashi: *See—*
Kayane, Yutaka; Omura, Takashi; Otake, Katsumasa; and Takeshita, Akira, 4,631,341, Cl. 544-189.000.

Ono, Shizumi: *See—*
Tsuchiya, Kanji; and Ono, Shizumi, 4,630,534, Cl. 99-483.000.

Ono, Tadahiro; and Igarashi, Shigenori, to Toshiba Kikai Kabushiki Kaisha; and Toei Denki Kabushiki Kaisha. Pulse generator. 4,631,523, Cl. 340-347.0SY.

Ono, Tatsuhiro; Koike, Shin'ichi; Tsuchiya, Haruhiko; and Inoue, Yuji, to NEC Corporation; and Nippon Telegraph & Telephone Public Corporation. Bidirectional communication system of a two-wire bus comprising an active terminator. 4,631,721, Cl. 370-85.000.

Onoda Cement Company, Ltd.: *See—*
Umemoto, Teruo; and Ogura, Eiji, 4,631,342, Cl. 544-313.000.

Ontario Research Foundation: *See—*
Sweet, Edmund G. F., 4,630,468, Cl. 73-59.000.

Oouchi, Kazuo: *See—*
Tsumura, Akio; Hayashi, Shun-ichi; Miyaake, Chiharu; Oouchi, Kazuo; and Yamamura, Yutaka, 4,631,110, Cl. 156-584.000.

Opfer, James E.; and Natarajan, Bangalore R., to Hewlett-Packard Company. Thin film magnetic recording film. 4,631,202, Cl. 427-131.000.

Orikawa, Michihiro: *See—*
Dan, Takuya; and Orikawa, Michihiro, 4,630,806, Cl. 267-140.100.

Ortho Pharmaceutical Corporation: *See—*
Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,631,283, Cl. 514-259.000.

Ortlip, Earl W., to Soil Teq., Inc. Method and apparatus for spreading fertilizer. 4,630,773, Cl. 239-1.000.

O'Ryan, David E.: *See—*
Hollstein, Thomas E.; Turner, James J.; Mulder, Douglas C.; and O'Ryan, David E., 4,630,777, Cl. 239-707.000.

Oshima, Masanao; and Yashima, Nobuyoshi, to Mitsui Engineering & Shipbuilding Co., Ltd. Artificial island. 4,630,969, Cl. 405-217.000.

Osterland, Robert W.; and Benedetti, Nicholas M., to USM Corporation. Molding clip. 4,630,338, Cl. 24-293.000.

Ostertag, Reinhard F.: *See—*
Ostertag, Ulrich K.; and Ostertag, Reinhard F., 4,630,940, Cl. 374-148.000.

Ostertag, Ulrich K.; and Ostertag, Reinhard F. Temperature display device for attachment to a water outlet. 4,630,940, Cl. 374-148.000.

Ostlinning, Edgar: *See—*
Idel, Karsten; Ostlinning, Edgar; and Freitag, Dieter, 4,631,336, Cl. 528-388.000.

Ostman, Kjell: *See—*
Severin, Eric; Jansson, Arne; and Ostman, Kjell, 4,630,734, Cl. 206-461.000.

Oszajca, Henri: *See—*
Marlier, Alain; and Oszajca, Henri, 4,630,488, Cl. 73-861.810.

Otake, Katsumasa: *See—*
Kayane, Yutaka; Omura, Takashi; Otake, Katsumasa; and Takeshita, Akira, 4,631,341, Cl. 544-189.000.

Otis Elevator Company: *See—*
Herrmann, Dietrich E.; and Abraham, Detlev, 4,631,467, Cl. 318-798.000.
McQueen, Norman, 4,630,543, Cl. 104-173.100.

Otis Engineering Corporation: *See—*
Boyle, William G.; and Fisher, Ernest P., Jr., 4,630,833, Cl. 277-188.00A.

Ott, William B.: *See—*
Bradley, David J.; and Ott, William B., 4,631,670, Cl. 364-200.000.

Oudejans, Johannes C.; Nootenboom, Peter; Ganguli, Keshab L.; and Lok, Cornelis M., to Internationale Octrooi Maatschappij "Octropa" P.B.V. Nickel/alumina/silicate catalyst, its preparation. 4,631,265, Cl. 502-259.000.

Owens-Corning Fiberglas Corporation: *See—*
Rapp, Charles F.; and Herrick, Robert A., 4,631,178, Cl. 423-210.000.

Owens-Illinois, Inc.: *See—*
Jones, James C., 4,631,086, Cl. 106-36.000.

Oxide & Chemical Corporation: *See—*
McKinney, Benjamin F., 4,631,026, Cl. 432-138.000.

Oyamada, Takashi: *See—*
Umetsu, Shinjiro; and Oyamada, Takashi, 4,631,640, Cl. 361-422.000.

Ozawa, Kazuo; and Nonoyama, Hideki, to Sony Corporation. Tape cassette with protection cover and tape end sensing means. 4,631,618, Cl. 360-132.000.

Pacific Roller Die Co., Inc.: *See—*
Davis, Paul K., 4,630,650, Cl. 138-154.000.

Padden, Timothy J.; and Uick, Heidi J., to S.C. Johnson & Son, Inc. Hair treating composition containing a quaternary ammonium compound containing an erucyl group. 4,631,187, Cl. 424-70.000.

Pakull, Ralf: *See—*
Kricheldorf, Hans R.; Pakull, Ralf; and Dicke, Hans-Rudolf, 4,631,333, Cl. 528-170.000.

Pakwa Engineering Ltd.: *See—*
Johnson, Dennis, 4,630,478, Cl. 73-299.000.

Palmer, James E.; Albertini, Rocco D.; and Coladonato, Michael A., to Baldt Incorporated. Acoustically detonated explosively releasable link. 4,630,522, Cl. 89-1.140.

Palmer, Robert S. Device to reaction train animals. 4,630,571, Cl. 119-29.000.

Palombo, Gaston: *See—*
Brooke, Raymond; and Palombo, Gaston, 4,631,524, Cl. 340-347.00P.

Pan, Pai-Hung: *See—*
Geipel, Henry J., Jr.; and Pan, Pai-Hung, 4,631,219, Cl. 428-131.000.

Panavision, Inc.: *See—*
Mayer, Albert L., 4,630,907, Cl. 352-75.000.

Panos, Nicholas: *See—*
Prickett, Michael J.; Mott, Murray H.; and Panos, Nicholas, 4,631,541, Cl. 343-5.0DP.

Paradyne Corporation: *See—*
Betts, William L.; and Zuranski, Edward, 4,631,738, Cl. 375-98.000.

Pardue, Von G.: *See—*
Alexander, James O.; King, William A.; May, William E.; and Pardue, Von G., 4,631,625, Cl. 361-94.000.

Parekh, Girish G.; and Blank, Werner J., to American Cyanamid Company. Coating compositions containing polyurethane or polyurea polymers and amino resins. 4,631,320, Cl. 525-452.000.

Parham, Thomas G.: *See—*
Beers, William W.; and Parham, Thomas G., 4,631,144, Cl. 252-301.40R.

Park, Arthur; and Wilson, Bob T., to Diamond Oil Well Drilling Company. Method for determining the placement of perforations in a well casing. 4,631,677, Cl. 364-422.000.

Park, Kyong; and Alwerud, Goran S., to Kavlico Corporation. Versatile force measuring system. 4,630,473, Cl. 73-161.000.

Parker Drilling Company: *See—*
Reed, Lowell M., 4,630,425, Cl. 52-745.000.

Parker, John, to Holset Engineering Company Limited. Wastegate valve for internal combustion engine turbocharger. 4,630,445, Cl. 60-602.000.

Parker, Theodore L., to Dow Chemical Company, The. Use, as latent cross-linkers for epoxy resins, of compounds which can be rearranged in situ to difunctional phenols. 4,631,331, Cl. 528-96.000.

Parker, Theodore L., to Dow Chemical Company, The. Use of benzo-n-heterocycles to advance epoxy resins. 4,631,332, Cl. 528-117.000.

Parkhurst, Larry E.; and Meadows, Michael R., to Dieterich Standard Corporation. Optic sensors. 4,631,401, Cl. 250-227.000.

Parks, Billy W., to Ryan-Walsh Stevedoring Company, Inc. Midstream coal handling apparatus. 4,631,125, Cl. 209-215.000.

Pasch, Nicholas, to LSI Logic Corporation. Method for forming an electrical contact in an integrated circuit. 4,631,248, Cl. 430-313.000.

Pasternack, Adalbert, to Dragerwerk AG. Respirator control device. 4,630,605, Cl. 128-205.240.

Pastore, Ronald. Combination rear view mirror and digital displays. 4,630,904, Cl. 350-600.000.

Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH: *See—*
Dannhauer, Gunter, 4,631,644, Cl. 362-105.000.

Pater, Ruth H.: *See—*
Scola, Daniel A.; and Pater, Ruth H., 4,631,335, Cl. 528-353.000.

Paul, Larry W. Camera gun. 4,630,911, Cl. 354-82.000.

Paul, Mark O., to Northrop Corporation. Vidicon image motion compensation technique. 4,631,583, Cl. 358-125.000.

Paulson, Jerome I. Kinetic gravity deduster. 4,631,124, Cl. 209-3.000.

Pavex, Inc.: *See—*
Place, Virgil A., 4,631,060, Cl. 604-285.000.

Pavlidis, Dimitri: *See—*
Magarshack, John; and Pavlidis, Dimitri, 4,631,492, Cl. 330-277.000.

Pawlowski, Georg, to Hoechst Aktiengesellschaft. Photosensitive composition admixture of a diazonium salt polycondensation product and polymeric binder with carboxyl side chain groups. 4,631,245, Cl. 430-175.000.

Pazarci, Melih: *See—*
LoCicero, Joseph L.; Pazarci, Melih; and Rzeszewski, Theodore S., 4,631,574, Cl. 358-12.000.

Pedersen, Peter: *See—*
Weerda, Hilko; and Pedersen, Peter, 4,630,606, Cl. 128-207.140.

Peerenboom, Robert J.: *See—*
Lassen, Frederich O.; Peerenboom, Robert J.; and Schultz, Cheri L., 4,631,062, Cl. 604-385.00R.

Peeters Weem, Jan A.; Krueger, David E.; and Graham, Dennis P., to Hyster Company. Twistlock operating mechanism. 4,630,856, Cl. 294-81.530.

Pellegrino, Peter P. Method and apparatus for mass producing printed circuit boards. 4,631,100, Cl. 156-150.000.

Pennwalt Corporation: *See—*
Georgiev, Vassil S.; and Mullen, George B., 4,631,340, Cl. 544-171.000.

Pentecost, Randal L. Marking device for tape measure. 4,630,376, Cl. 33-138.000.

Pepmiller, Paul E.: *See—*
Huffman, Charles E.; and Pepmiller, Paul E., 4,631,719, Cl. 370-15.000.

Perovick, Matthew J.; and Lang, James W., to Unidyne, Inc. Hydromassage apparatus. 4,630,599, Cl. 128-66.000.

Persson, Gerthy: *See—*
Persson, Tor; and Persson, Gerthy, 4,630,854, Cl. 292-343.000.

Persson, Tor; and Persson, Gerthy. Security device. 4,630,854, Cl. 292-343.000.

Pertramer, Siegried. Trapeze belt or harness for windsurfing. 4,630,563, Cl. 114-39.000.

Peschka, Walter: *See—*
Sanger, Georg; Hietkamp, Gerrit; and Peschka, Walter, 4,631,096, Cl. 149-1.000.

Peter, David A., to General Motors Corporation. Method and apparatus for ultrasonic plastic forming and joining. 4,631,685, Cl. 364-476.000.

Peters, John W.: *See—*
Hall, James T.; and Peters, John W., 4,631,199, Cl. 427-54.100.

Peters, Klaus-Jurgen: *See—*
Nusser, Hermann; and Peters, Klaus-Jurgen, 4,630,578, Cl. 123-179.00G.

Peters, Philip H., Jr., to General Electric Company. Integral crystal-controlled line-voltage ballast for compact RF fluorescent lamps. 4,631,449, Cl. 315-205.000.

Petersen, Borge; and Nally, Rickard P., to NCR Corporation. Quick releasing, pinch roller mechanism. 4,630,815, Cl. 271-273.000.

Petersen, Erling N.; Jensen, Leif H.; Watjen, Frank; and Seidelmann, Dieter, to Schering Aktiengesellschaft. β-Carboline-3-carboxylic acid derivatives, and their use as psychotropic agents. 4,631,285, Cl. 514-292.000.

Petersen, Hans C.; and Kyster, Erik, to Danfoss A/S. Hydrostatic control device, particulary steering device. 4,631,010, Cl. 418-61.00B.

Petroff, Peter D. Flow analyzer. 4,630,474, Cl. 73-196.000.

Petrolite Corporation: *See—*
Johns, Marshall E.; Strassner, Keith D.; and Braga, Thomas G., 4,631,138, Cl. 252-8.555.

Petrzilka, Martin; and Villiger, Alois, to Hoffmann-La Roche Inc. Benzonitriles. 4,630,896, Cl. 350-350.00R.

Peugeot, Michel, to Aciers et Outillage Peugeot. Device for electrically controlling the position of a sliding opening panel of a motor vehicle. 4,631,461, Cl. 318-280.000.

Peyre, Xavier M.; and Manesse, Jean-Pierre, to Plastibenne. Nacelle. 4,630,542, Cl. 104-114.000.

Pfizer Hospital Products Group Inc.: *See—*
Andrews, Henry L.; and Gardiner, Gregory E., 4,631,082, Cl. 75-235.000.

Pfizer Inc.: *See—*
Volkmann, Robert A., 4,631,345, Cl. 548-147.000.

Philipp Holzmann Aktiengesellschaft: *See—*
Muller, Eberhard, 4,630,798, Cl. 249-50.000.

Phillips Petroleum Company: *See—*
Bade, Robert K., 4,630,469, Cl. 73-61.10C.
Mumallah, Naim A.; Bruning, Donald D.; and Needham, Riley B., 4,630,678, Cl. 166-281.000.
Wilder, Charles R., 4,631,304, Cl. 523-215.000.

Philp, Charles W.: *See—*
McDonald, Allen S.; Philp, Charles W.; and Sperakis, Thomas A., 4,631,171, Cl. 420-481.000.

Piasecki, Douglas S., to RCA Corporation. TTL circuit with a clamping transistor for speedy turn-off of output transistor. 4,631,422, Cl. 307-300.000.

Piatt, Michael J.; and Brown, Mark E., to Eastman Kodak Company. Device and method for sensing the impact position of an ink jet on a surface of an ink catcher, in a continuous ink jet printer. 4,631,550, Cl. 346-1.100.

Piazza, Pietro: *See—*
Amici, Francis R.; Farrington, Richard I.; and Piazza, Pietro, 4,630,756, Cl. 222-78.000.

Pica, Albert P., to RCA Corporation. Video display device simulation apparatus and method. 4,631,691, Cl. 364-521.000.

Picker International Limited: *See—*
Young, Ian R., 4,631,480, Cl. 324-309.000.
Young, Ian R.; Evans, Philip R.; and Luker, Peter A., 4,631,481, Cl. 324-320.000.

Picot, Pascal: *See—*
Levrai, Roland; Courbot, Pierre; and Picot, Pascal, 4,630,711, Cl. 184-6.120.

Pieczykolan, George S., to Central Sprinkler Corporation. Rapid response sprinkler head. 4,630,682, Cl. 169-38.000.

Pierce, Bill L.: *See—*
Spurrier, Francis R.; Pierce, Bill L.; and Wright, Maynard K., 4,631,239, Cl. 429-39.000.

Pierce, John M.; and Lehrer, William I., to Fairchild Camera & Instrument Corp. Product for making isolated semiconductor structure. 4,630,343, Cl. 29-576.00W.

Pierini, Marco, to Varian S.p.A. Ion pump. 4,631,002, Cl. 417-49.000.

Pierrat, Frank A.: *See—*
Shutske, Gregory M.; and Pierrat, Frank A., 4,631,286, Cl. 514-297.000.

Pierrat, Jacques, to Hutchinson Societe Anonyme. Resilient coupling with a limited range of radial movement, more particularly for a pulled wheel attachment. 4,630,810, Cl. 267-153.000.

Pifer, Richard L.: *See—*
Allmandinger, Donald D.; and Pifer, Richard L., 4,630,506, Cl. 74-713.000.

Pilgrim, Thomas A., to BPB Industries Public Limited Company. Building components. 4,630,419, Cl. 52-309.130.

Pilkington P.E. Limited: *See—*
Jones, Richard I., 4,630,903, Cl. 350-579.000.

Pilling Co.: *See—*
Kulp, Rodney J.; and Furey, Andrew J., 4,630,378, Cl. 33-185.00R.

Pintchovski, Faivel S.: *See—*
Kesaler, Peter H.; Calvert, Wilson D., Sr.; and Pintchovski, Faivel S., 4,630,669, Cl. 165-1.000.

Pinter, Janos: *See—*
Harsanyi, Jozsef; Pinter, Janos; and Suri, Alajos, 4,630,931, Cl. 366-107.000.

Pioneer Electronic Corp.: *See—*
Ikedo, Yuji; and Kase, Masao, 4,631,716, Cl. 369-75.200.
Takahashi, Yoshiaki, 4,631,490, Cl. 330-51.000.
Utsumi, Yoshihiro, 4,631,396, Cl. 250-201.000.

Piorkowska-Palczewska, Ewa; Galeski, Andrzej; and Kryszewski, Marian, to Polska Akademia Nauk Centrum Badan Molekularnych i Makromolekularnych. Method of determination of thermal conduction coefficient and heat capacity of materials and the apparatus for measurements of thermal conduction coefficient and heat capacity of material. 4,630,938, Cl. 374-44.000.

PipercrossLimited: *See—*
Spicer, Barry; and Wills, Joseph T., 4,631,077, Cl. 55-487.000.

Pisciotta, Michel: *See—*
Cinquin, Jean P.; Gazzolo, Christian; and Pisciotta, Michel, 4,631,508, Cl. 335-142.000.

Pismennaya, Galina: *See—*
Minten, Karl L.; Battisti, Angelo J.; and Pismennaya, Galina, 4,631,117, Cl. 204-15.000.

Pithouse, Kenneth B.; Kridl, Thomas A.; and Triplett, James T., to Raychem Limited. Heat-recoverable article. 4,631,098, Cl. 156-86.000.

Pitney Bowes Inc.: *See—*
Salazar, Edilberto I.; Kirschner, Wallace; Lorenzo, John L.; Schubert, Keith E.; and Pollak, Philip, Jr., 4,631,681, Cl. 364-464.000.

Pittet, Alan O.: *See—*
Courtney, Thomas F., Jr.; Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; and Wiener, Charles, 4,631,194, Cl. 426-535.000.

Place, Virgil A., to Pavex, Inc. Vaginal spermicide distributing membrane. 4,631,060, Cl. 604-285.000.

Planet Products, Corporation: *See—*
Steurmer, Karl H., 4,630,725, Cl. 198-425.000.

Plastibenne: *See—*
Peyre, Xavier M.; and Manesse, Jean-Pierre, 4,630,542, Cl. 104-114.000.

Plastic Oddities, Inc.: *See—*
Izzi, Lewis B., Sr., 4,630,368, Cl. 30-289.000.

Plavac, Frank, to Chevron Research Company. Glycidol modified succinimides and fuel compositions containing the same. 4,631,070, Cl. 44-63.000.

Plessey South Africa Limited: *See—*
Braun, Robin M., 4,631,497, Cl. 331-4.000.

PLM AB: *See—*
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,631,163, Cl. 264-291.000.

Ploussios, George, to Tideland Signal Corporation. S-band coaxial slot array antenna. 4,631,544, Cl. 343-771.000.

Plumeret, Raymond: *See—*
Guery, Jean-Pierre; Gashet, Gerald; Olifant, Jacques; and Plumeret, Raymond, 4,631,507, Cl. 335-27.000.

Plunkett, David O.: *See—*
Graham, Stephen L.; Plunkett, David O.; and Lacey, Robert S., 4,631,308, Cl. 524-272.000.

Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Uytterhoeven, Herman; de Winter, Walter; Hoffarth, Gunther; and Richter, Wolfgang, to Agfa Gevaert Aktiengesellschaft. Electrostatographic suspension developer and a process for the production thereof. 4,631,243, Cl. 430-114.000.

Poersch, Hans; and Stark, Gustav, to Siemens Aktiengesellschaft. Peripheral auxiliary system for the automatic feeding and unloading of a stamping/nibbling machine. 4,630,987, Cl. 414-32.000.

Poetsch, Eike: *See—*
Praefcke, Klaus; Kohne, Bernd; Poules, Wadi; and Poetsch, Eike, 4,631,143, Cl. 252-299.620.

Pohl, Fritz. Method in which elemental particles electrophoretically migrate through a gel onto a collecting surface of a moving belt. 4,631,120, Cl. 204-182.800.

Pohl, Fritz. Electrophoretic apparatus employing a collecting belt moving in contact with a gel. 4,631,122, Cl. 204-299.00R.

Poirier, Marc-Andre , to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources. Road asphalt compositions containing visbreaking residues. 4,631,088, Cl. 106-273.00R.

Polaroid Corporation: *See—*
Czumak, Frank M.; and Sulesky, Donald J., 4,630,914, Cl. 354-212.000.
Hicks, John W., Jr., 4,630,889, Cl. 350-96.300.
Mehta, Avinash C., 4,631,327, Cl. 526-256.000.
Simon, Myron S.; and Waller, David P., 4,631,344, Cl. 548-146.000.
Whiteside, George D., 4,630,912, Cl. 354-88.000.
Whiteside, George D.; and Cavallaro, Robert E., 4,630,915, Cl. 354-275.000.

Pollak, Philip, Jr.: *See—*
Salazar, Edilberto I.; Kirschner, Wallace; Lorenzo, John L.; Schubert, Keith E.; and Pollak, Philip, Jr., 4,631,681, Cl. 364-464.000.

Polska Akademia Nauk Centrum Badan Molekularnych i Makromolekularnych: *See—*
Piorkowska-Palczewska, Ewa; Galeski, Andrzej; and Kryszewski, Marian, 4,630,938, Cl. 374-44.000.

Pontani, Susanne. Method and composition for simultaneously permanently waving and dyeing human hair. 4,630,621, Cl. 132-7.000.

Popow, Anatoliy. Continuous molding method. 4,631,161, Cl. 264-167.000.

Popperling, Rolf K.: *See—*
von Hagen, Ingo; Hillenbrand, Hans-Georg; and Popperling, Rolf K., 4,631,095, Cl. 148-12.00F.

Portugall, Michael: *See—*
Ringsdorf, Helmut; Portugall, Michael; Schmidt, Hans W.; and Etzbach, Karl H., 4,631,328, Cl. 526-259.000.

Potter, Clinton; and Hasty, Robert. Intercom system. 4,631,365, Cl. 379-167.000.

Potter, Gary F.: *See—*
Reeves, Henry C., III; Potter, Gary F.; and Riley, Suzanne M., 4,630,679, Cl. 166-305.100.

Poules, Wadi: *See—*
Praefcke, Klaus; Kohne, Bernd; Poules, Wadi; and Poetsch, Eike, 4,631,143, Cl. 252-299.620.

Powerton, division of Contraves Goerz Corporation: *See—*
Nagarkatti, Ashok; Lordo, Robert E.; and Kind, Burkhart, 4,631,510, Cl. 336-135.000.

PQ Corporation: *See—*
Sobus, Michael T., 4,631,193, Cl. 426-330.400.

Pradet, Gerard: *See—*
Hales, Patrick; Laurier, Jean-Pierre; and Pradet, Gerard, 4,630,596, Cl. 128-1.00R.

Praefcke, Klaus; Kohne, Bernd; Poules, Wadi; and Poetsch, Eike, to Merck Patent Gesellschaft mit beschrankter Haftung. Triphenylene derivatives. 4,631,143, Cl. 252-299.620.

Prataviera, Giovanni: *See—*
Zago, Giovanni; and Prataviera, Giovanni, 4,631,616, Cl. 360-128.000.

Preis, Lothar: *See—*
Blahak, Johannes; Dhein, Rolf; Preis, Lothar; and Schreckenberg, Manfred, 4,631,319, Cl. 525-437.000.

Premi, Mauro, to Mesdan S.p.A. Method for the splicing of textile threads by means of a compressed gas, and splicing device for the accomplishment of the method. 4,630,433, Cl. 57-22.000.

Pressman, David; and Goulter, Victor H. Produce knife with depth-limiting and peel aiding fence. 4,630,367, Cl. 30-279.00R.

Presswood, J. Kenneth, to Ethyl Corporation. Mixed diamine chain extender. 4,631,298, Cl. 521-163.000.

Pretorius, David J., to National Savings & Finance Corp. (Proprietary) Limited, The. Selective embosser with buckling prevention. 4,630,537, Cl. 101-3.00R.

Priam Corporation: *See—*
Viskochil, Stephen R., 4,631,431, Cl. 310-13.000.

Price & Adams: *See—*
Sherman, James L., 4,630,974, Cl. 405-288.000.

Price, John G. C., to Dow Corning Ltd. Siloxane compositions and process for treatment of materials. 4,631,207, Cl. 427-387.000.

Prickett, Michael J.; Mott, Murray H.; and Panos, Nicholas, to United States of America, Navy. Microprocessor based programmable frequency controller for frequency agile radar. 4,631,541, Cl. 343-5.0DP.

Prieto, Yolanda: *See—*
Davis, Walter L.; Prieto, Yolanda; and Smoot, George W., 4,631,737, Cl. 375-88.000.

Prima Progetti S.p.A.: *See—*
Gilli, Luigi; and Sartorio, Franco, 4,630,992, Cl. 414-744.00R.

Primages, Inc.: *See—*
Chu, Mosi; and Kuo, Meng S., 4,630,950, Cl. 400-639.100.

Pro-Tec Sports, Inc.: *See—*
Spencer, Treesa; and Alberta, Terry, 4,630,600, Cl. 128-80.00R.

Proctor & Gamble Company, The: *See—*
Juneja, Prem S., 4,631,064, Cl. 8-161.000.

Proni, Oscar; and James, Bobby D., to Coulter Electronics, Inc. Particle analyzing apparatus and method of moving particles in suspension through such apparatus. 4,631,483, Cl. 324-71.400.

Propice, Jean: *See—*
Guillaume, Paul; Kayser, Didier; and Propice, Jean, 4,630,555, Cl. 110-346.000.

Przybylinski, Phillip G.; and Spence, John H., to Pullman Standard Inc. Cross bearer arrangement for slotted center sill. 4,630,547, Cl. 105-416.000.

Przybylinski, Phillip G.: *See—*
Wiger, Henry K.; and Przybylinski, Phillip G., 4,630,548, Cl. 105-416.000.

Pugh, James W. Computerized video gait and motion analysis system and method. 4,631,676, Cl. 364-413.000.

Pullman Standard Inc.: *See—*
Przybylinski, Phillip G.; and Spence, John H., 4,630,547, Cl. 105-416.000.
Wiger, Henry K.; and Katz, Manfred, 4,630,546, Cl. 105-416.000.

Wiger, Henry K.; and Przybylinski, Phillip G., 4,630,548, Cl. 105-416.000.

Quadrex HPS, Inc.: *See*—
Capella, Joseph A.; and Fowler, David E., 4,630,625, Cl. 134-104.000.

Quin, Philippe P., to Automobiles Citroen; and Automobiles Peugeot. Electro-hydraulic height corrector for motor vehicles. 4,630,527, Cl. 91-449.000.

Qureshi, Shahid U. H., to Codex Corporation. Coded modulation system with feedback. 4,631,735, Cl. 375-34.000.

R. W. Grace & Co.: *See*—
Cuisia, Dionisio G.; and Hwa, Chih M., 4,631,131, Cl. 210-697.000.

Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., to General Electric Company. Lighting circuit breaker panelboard modular assembly. 4,631,634, Cl. 361-358.000.

Radakovich, Thomas: *See*—
Supcoe, Robert F.; and Radakovich, Thomas, 4,631,302, Cl. 523-122.000.

Rademachers, Jakob; Naumann, Rolf; and Teichmann, Gunther, to Bayer Aktiengesellschaft. Color-intensive iron oxide black pigments and process for their production. 4,631,089, Cl. 106-304.000.

Rademachers, Jakob: *See*—
Naumann, Rolf; Leitner, Lutz; Rademachers, Jakob; and Buxbaum, Gunter, 4,631,090, Cl. 106-304.000.

Raeth, Franz J.: *See*—
Chilinski, Herbert; Getzlaff, Klaus J.; Hajdu, Johann; and Raeth, Franz J., 4,631,663, Cl. 364-200.000.

Raeymaekers, Alfons H. M.: *See*—
Boeckx, Gustaaf M.; Raeymaekers, Alfons H. M.; and Sipido, Victor, 4,631,278, Cl. 514-242.000.

Rainbow Lifegard Products, Inc.: *See*—
Sasaki, Isao; and Schuman, Michael L., 4,630,634, Cl. 137-268.000.

Raines, Dennis R.: *See*—
Novak, John W., Jr.; Raines, Dennis R.; and Bray, Donald J., 4,630,665, Cl. 164-97.000.

Raines, Kenneth C., to Burron Medical, Inc. Guard for right angle winged infusion needle. 4,631,058, Cl. 604-263.000.

Raleigh, Freddie L., to Warner & Swasey Company, The. Bridge type coordinate measuring machine. 4,630,374, Cl. 33-1.00M.

Ramsey, Russel G., to Central Plastics Company. Thermoplastic fitting electric heat welding apparatus. 4,631,107, Cl. 156-359.000.

Rand McNally & Co.: *See*—
Breen, Thomas J., 4,630,384, Cl. 40-21.00R.

Rand, Roy E.; and Couch, John L., to Imatron, Inc. Beam spot monitoring arrangement for use in a scanning electron beam computed tomography scanner and method. 4,631,741, Cl. 378-10.000.

Randall, Bruce E., to Sangamo Weston, Inc. Biasing for magnetic circuits. 4,631,604, Cl. 360-66.000.

Randolph, Marshall C.: *See*—
Keith, Robert C.; VandenBerg, Teunis; Randolph, Marshall C.; Lewis, Thomas B.; and Gillis, Patrick J., Jr., 4,631,126, Cl. 210-108.000.

Ranney, Robert. Wall and ceiling light device. 4,631,647, Cl. 362-147.000.

Rapaich, Mark, to Heath Company. ROM compensated microphone. 4,631,749, Cl. 381-103.000.

Rapiteau, Jean: *See*—
Mandon, Jean-Pierre; and Rapiteau, Jean, 4,630,775, Cl. 239-56.000.

Rapp, Charles F.; and Herrick, Robert A., to Owens-Corning Fiberglas Corporation. Method of removing boric oxide from flue gases. 4,631,178, Cl. 423-210.000.

Rathbun, Donald J.; Tarbox, Bruce H.; and Su, Taian, to Honeywell Information Systems Inc. Mass storage disk drive defective media handling. 4,631,723, Cl. 371-10.000.

Rattunde, Manfred, to Reimers Getriebe AG. Infinitely variable cone-disk transmission. 4,631,042, Cl. 474-8.000.

Rauscher, Christen, to United States of America, Navy. Microwave frequency divider having regenerative oscillation. 4,631,500, Cl. 331-51.000.

Ray, John R.; Williamson, Michael A.; and Smith, James D. B., to Westinghouse Electric Corp. Accelerator combinations for anaerobic polymerization. 4,631,325, Cl. 526-220.000.

Raychem Corporation: *See*—
O'Brien, Michael T.; Sopory, Umesh K.; and Fang, Shou-Mean, 4,631,392, Cl. 219-549.000.
Simpson, John A.; Melton, Keith; and Duerig, Tom, 4,631,094, Cl. 148-11.50F.

Raychem Limited: *See*—
Pithouse, Kenneth B.; Kridl, Thomas A.; and Triplett, James T., 4,631,098, Cl. 156-86.000.

Raymond, Kenneth W. Intake valve rocker arms of certain six cylinder internal combustion engines. 4,630,576, Cl. 123-90.360.

Raytheon Company: *See*—
Tardif, Arthur J., 4,631,747, Cl. 381-51.000.

RCA Corporation: *See*—
Avery, Leslie R., 4,631,562, Cl. 357-13.000.
Bingley, John D., 4,631,470, Cl. 323-282.000.
Brown, Paul R., 4,631,503, Cl. 333-24.100.
Credelle, Thomas L.; and Firester, Arthur H., 4,630,893, Cl. 350-334.000.
D'Amato, Ralph J.; and Godfrey, Richard H., 4,631,439, Cl. 313-402.000.
Elliott, George A., 4,630,459, Cl. 12-307.000.
George, John B., 4,631,595, Cl. 358-243.000.
Lee, Wayne, 4,631,591, Cl. 358-190.000.
Morrell, Albert M.; and Masterton, Walter D., 4,631,441, Cl. 313-408.000.
Neilson, John M. S.; Wheatley, Carl F., Jr.; and Brackelmanns, Norbert W., 4,631,564, Cl. 357-23.400.
Piasecki, Douglas S., 4,631,422, Cl. 307-300.000.
Pica, Albert P., 4,631,691, Cl. 364-521.000.
Reitmeier, Glenn A., 4,631,584, Cl. 358-141.000.
Villanyi, Sigmund T., 4,631,443, Cl. 313-417.000.
Wendt, Frank S., 4,631,652, Cl. 363-16.000.
Wine, Charles M., 4,631,585, Cl. 358-148.000.

Reboux, Jean: *See*—
Delage, Daniel; and Reboux, Jean, 4,631,381, Cl. 219-10.570.

Redl, Heinz; and Habison, Georg, to Immuno Aktiengesellschaft fur chemisch-medizinische Produkte. Apparatus for applying a tissue adhesive. 4,631,055, Cl. 604-82.000.

Redmon, Larry, to Challenge Tool & Manufacturing, Inc. Speed changing device. 4,631,044, Cl. 474-114.000.

Reed, Charles C.; and Cooley, Denton A. Autotransfusion system and method. 4,631,050, Cl. 604-4.000.

Reed Devices, Inc.: *See*—
Naylor, Herbert C.; Smith, Gregory J.; and Roeser, Howard J., Jr., 4,630,882, Cl. 339-198.00R.

Reed, Lowell M., to Parker Drilling Company. Erection means for portable drilling system. 4,630,425, Cl. 52-745.000.

Reeves, Henry C., III; Potter, Gary F.; and Riley, Suzanne M., to Dowell Schlumberger Incorporated. Method for treatment and/or workover of injection wells. 4,630,679, Cl. 166-305.100.

Reeves, James B., Jr. Adjustable herringbone lock joint. 4,630,960, Cl. 403-345.000.

Regie Nationale des Usines Renault: *See*—
Korb, Jean P.; and Lagrue, Jean P., 4,631,680, Cl. 364-431.050.
Teshima, Tohru; Naete, Hidehiko; and Robert, Pierre H., 4,631,513, Cl. 340-52.00R.

Regiert, Marlies: *See*—
Gebauer, Helmut; and Regiert, Marlies, 4,631,146, Cl. 252-522.00R.

Rehman, William R.; and Smith, James C., to Nordson Corporation. Foam generating nozzle. 4,630,774, Cl. 239-8.000.

Reichmann, Siegfried, to Robert Bosch GmbH. Driving device having a reversible electric motor. 4,631,460, Cl. 318-280.000.

Reimers Getriebe AG: *See*—
Rattunde, Manfred, 4,631,042, Cl. 474-8.000.

Reinecke, Paul: *See*—
Kraatz, Udo; Buchel, Karl H.; Hanssler, Gerd; Brandes, Wilhelm; and Reinecke, Paul, 4,631,288, Cl. 514-340.000.

Reinhard, Donnie K.: *See*—
Asmussen, Jes; and Reinhard, Donnie K., 4,630,566, Cl. 118-50.100.

Reinking, Klaus: *See*—
Wingler, Frank; Koch, Otto; Lindner, Christian; and Reinking, Klaus, 4,631,311, Cl. 525-67.000.

Reinwall, Ernest W.; and Spibey, John, to Elco Industries, Inc. Assembly for fastening a layer of compressible material to a rigid member. 4,630,984, Cl. 411-368.000.

Reitmeier, Glenn A., to RCA Corporation. Transmission of reduced resolution picture edge information using horizontal blanking period. 4,631,584, Cl. 358-141.000.

Reitsam, Franz X.: *See*—
Keiler, Manfred; Bartsch, Uwe; Drosemeyer, Hans-Heinrich; and Reitsam, Franz X., 4,630,382, Cl. 34-173.000.

Reliance Electric Company: *See*—
Marks, Robert J., 4,631,353, Cl. 174-16.00R.

Rellis, Daniel, Jr.; Fosnacht, Donald R.; and Jackson, Charles R., to Inland Steel Company. Apparatus for adding solid alloying ingredients to molten metal stream. 4,630,801, Cl. 266-216.000.

Renn, Robert M.; and Shoemaker, John R., to AMP Incorporated. Zero insertion force electrical interconnection assembly. 4,630,874, Cl. 339-17.00F.

Reppert, Rudi: *See*—
Kugler, Artur; Reppert, Rudi; and Zaunberger, Franz-Xaver, 4,630,507, Cl. 74-733.000.

Research Corporation: *See*—
Hwang, Wen-Fang; Wiff, Donald R.; and Helminiak, Thaddeus E., 4,631,318, Cl. 525-432.000.
Yankeelov, John A., Jr.; and Fok, Kam-Fook, 4,631,270, Cl. 514-15.000.

Research Development Corporation of Japan: *See*—
Hayashi, Chikara, 4,631,250, Cl. 430-329.000.

Retersdorf, James P.: *See*—
Kumpitsch, Robert C.; Retersdorf, James P.; and Lewis, Charles W., 4,630,881, Cl. 339-176.00R.

Reule, Hans; and Ganzle, Hartmut, to International Standard Electric Corporation. Temperature compensated electron gun system. 4,631,442, Cl. 313-414.000.

Reuss, Robert H.: *See*—
Birrittella, Mark S.; Reuss, Robert H.; and Seelbach, Walter C., 4,631,570, Cl. 357-49.000.

Revelli, Anthony J.; and Greenfield, Herbert. Dispersing apparatus with wire wheel impeller. 4,630,932, Cl. 366-279.000.

Reynolds, Desmond H. J.; and Taft, Philip A., to Lucas Industries Public Limited Company. Hydrostatic hydraulic coupling. 4,630,630, Cl. 137-68.100.

Reynolds Metals Company: *See*—
Stewart, Douglas V.; Tabereaux, Alton T.; and Willett, John T., 4,631,121, Cl. 204-243.00R.

Rezvani, Behruz: *See*—
Vendelin, George D.; and Rezvani, Behruz, 4,631,493, Cl. 330-277.000.

Rheon Automatic Machinery Co., Ltd.: *See*—
Hayashi, Torahiko, 4,631,017, Cl. 425-335.000.
Hayashi, Torahiko, 4,631,021, Cl. 425-140.000.

Rhodes, Lynn R. Method for finishing a thermoplastic coating. 4,630,407, Cl. 51-322.000.

Rhone-Poulenc Specialites Chimiques: *See*—
Laisney, Bernard; and Duvernay, Maurice, 4,631,299, Cl. 521-77.000.

Rice, William E.: *See*—
Lambert, James; and Rice, William E., 4,630,786, Cl. 242-96.000.

Richard, Maureen M.: *See*—
Burkhardt, Norman S.; Richard, Maureen M.; Buxton, Forrest T.; and Nowak, Ronald J., 4,631,598, Cl. 358-280.000.

Richard Wolf GmbH: *See*—
Bonnet, Ludwig, 4,630,598, Cl. 128-7.000.

Richards Technical Products, Inc.: *See*—
Adams, William H., 4,630,449, Cl. 62-130.000.

Richter, Ernst-Jurgen. Artificial dental prosthesis. 4,631,031, Cl. 433-173.000.

Richter, Wolfgang: *See*—
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Uytterhoeven, Herman; de Winter, Walter; Hoffarth, Gunther; and Richter, Wolfgang, 4,631,243, Cl. 430-114.000.

Ricoh Company, Ltd.: *See*—
Kawakubo, Toshio; Ishikawa, Chuji; and Yokoyama, Shizuo, 4,630,814, Cl. 271-272.000.
Kawanishi, Toshiyuki; Shimada, Masaru; Murakami, Kakuji; Aruga, Tamotsu; and Uemura, Hiroyuki, 4,631,085, Cl. 106-22.000.
Ogawa, Mutsuo, 4,631,597, Cl. 358-258.000.
Sekiya, Takuro, 4,631,553, Cl. 346-140.00R.

Ricome, Bernard: *See*—
Berthet, Hubert; Laugier, Noel; and Ricome, Bernard, 4,630,968, Cl. 405-195.000.

Riebeek, G. Fred, to American Microsystems, Inc. High voltage compressing input buffer. 4,631,429, Cl. 307-490.000.

Rieck, Hans-Peter; Schott, Martin; and Russow, Jurgen, to Hoechst Aktiengesellschaft. Shaped articles of silicate material, a process for their production and their use. 4,631,158, Cl. 264-43.000.

Rieder, Heinz; and Schwaiger, Max, to RSF Elektronik Gesellschaft m.b.H. Length measuring instrument comprising a scale member and a signal-generating scanning unit which is movable along the scale member. 4,631,403, Cl. 250-237.00G.

Rieper, Wolfgang: *See*—
Dietz, Erwin; Munkel, Albert; Hafner, Otmar; Rieper, Wolfgang; and Kroh, Adolf, 4,631,330, Cl. 528-49.000.

Rieter Machine Works Limited: *See*—
Verzilli, Giuseppe; and Schmid, Rene, 4,630,337, Cl. 19-296.000.

Riley, Suzanne M.: *See*—
Reeves, Henry C., III; Potter, Gary F.; and Riley, Suzanne M., 4,630,679, Cl. 166-305.100.

Rinehart, Kenneth L., Jr.; Harbour, Gary C.; and Kobayashi, Jun'ichi, to University of Illinois. Antiviral eudistomins from a marine tunicate. 4,631,149, Cl. 540-546.000.

Ringsdorf, Helmut; Portugall, Michael; Schmidt, Hans W.; and Etzbach, Karl H., to BASF Aktiengesellschaft. Polymers containing mesogenic groups and dye radicals in the side chains. 4,631,328, Cl. 526-259.000.

Riom Laboratories C.E.R.M. "RL-C.E.R.M." S.A.: *See*—
Combourieu, Michel; Bernet, Yvon; Laigle, Jean-Claude; and Simbille, Nadine, 4,631,277, Cl. 514-239.000.

Rippes S.A.: *See*—
Courrege, Claude, 4,631,023, Cl. 431-329.000.

Ritter, Betty J.; and Ritter, Ronald G. Protective capsule. 4,631,038, Cl. 441-80.000.

Ritter, Ronald G.: *See*—
Ritter, Betty J.; and Ritter, Ronald G., 4,631,038, Cl. 441-80.000.

Ritter, Thomas A.; Bray, James C.; and Kaganov, Alan L., to American Cyanamid Company. Heart pacer lead wire with pull-away needle. 4,630,617, Cl. 128-784.000.

Rix, Clifford, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Apparatus and method for filament winding cylindrical bodies with closed end. 4,631,101, Cl. 156-175.000.

Rizkalla, Nabil, to Halcon SD Group, Inc., The. Preparation of acetic acid. 4,631,348, Cl. 562-607.000.

Robbins, John D., to North American Philips Consumer Electronics Corp. Color cathode ray tube having smooth screen edges. 4,631,440, Cl. 313-403.000.

Robert Bosch GmbH: *See*—
Biermann, Eberhard; Nagele, Erwin; and Romann, Peter, 4,630,487, Cl. 73-861.760.
Guntert, Josef; and Hafele, Walter, 4,630,586, Cl. 123-500.000.
Hofer, Gerald; Hofmann, Eberhard; Laufer, Helmut; Rossignol, Francois; Schwartz, Reinhard; Straubel, Max; and Tissot, Raymond, 4,630,587, Cl. 123-502.000.
Knetsch, Manfred; and Kuhne, Wolfgang, 4,631,478, Cl. 324-207.000.
Kuttner, Thomas; Straubel, Max; and Wessel, Wolf, 4,630,582, Cl. 123-339.000.
Nusser, Hermann; and Peters, Klaus-Jurgen, 4,630,578, Cl. 123-179.00G.
Reichmann, Siegfried, 4,631,460, Cl. 318-280.000.

Robert, Pierre H.: *See*—
Teshima, Tohru; Naete, Hidehiko; and Robert, Pierre H., 4,631,513, Cl. 340-52.00R.

Robert Shaw Controls Company: *See*—
Ochsner, Rolf H.; and Everett, Charles J., 4,630,360, Cl. 29-622.000.

Roberts, Frank L., to Bio-Support Industries Ltd. Portable seat. 4,630,863, Cl. 297-219.000.

Robertshaw Controls Company: *See*—
Sliger, Boyd P.; and Wagner, Joseph P., 4,630,770, Cl. 236-34.500.

Robertson, David W., to Eli Lilly and Company. 6-(pyridinylphenyl)-dihydropyridazinones as inotropic agents. 4,631,279, Cl. 514-247.000.

Robida, James E.: *See*—
Handel, Martin G.; Robida, James E.; and Slusarski, Ronald S., 4,631,528, Cl. 340-545.000.

Robinair Division: *See*—
Murray, Gary P., 4,631,006, Cl. 417-234.000.

Robotic Vision Systems, Inc.: *See*—
Ross, Joseph; and DiMatteo, Paul, 4,630,910, Cl. 354-76.000.

Rocha Cabral, Jose E.; and Correa Mellone, Oswaldo A. Pencil holder. 4,630,953, Cl. 401-83.000.

Rockwell International Corporation: *See*—
Dumas, Ted A.; and Griffee, Les V., 4,631,546, Cl. 343-833.000.
Huffman, Charles E.; and Pepmiller, Paul E., 4,631,719, Cl. 370-15.000.
Klinchuch, John F., 4,631,463, Cl. 318-558.000.
McCollum, Patrick E.; Brownrigg, James K.; and Linder, Carl O., 4,631,472, Cl. 323-325.000.

Roczyn, Hans-Gerd, to Swiss Aluminium Ltd. Process for manufacturing a device and extrusion billet for this. 4,631,236, Cl. 428-558.000.

Roda, Gary E. Method and apparatus for carrying snow skis. 4,630,842, Cl. 280-814.000.

Roehr, Kuno M.: *See*—
Eibach, Wolfgang; Roehr, Kuno M.; and Schulz, Klaus M., 4,631,661, Cl. 364-200.000.

Roeser, Howard J., Jr.: *See*—
Naylor, Herbert C.; Smith, Gregory J.; and Roeser, Howard J., Jr., 4,630,882, Cl. 339-198.00R.

Rogers, Steven H.; and Hwang, Thomas J., to NCR Corporation. Method for forming improved contacts between interconnect layers of an integrated circuit. 4,630,357, Cl. 29-590.000.

Rogler, Wolfgang: *See*—
Markert, Helmut; Hauschildt, Klaus-Robert; Rogler, Wolfgang; and Kretzschmar, Klaus, 4,631,306, Cl. 523-457.000.

Rohm & Haas Company: *See*—
Kalyanaraman, Palaiyur S., 4,631,249, Cl. 430-325.000.

Rohmer, Daniel; and Scherrer, Alain, to Manufacture de Machines du Haut-Rhin. Apparatus for the introduction of a piece into a seat in an object. 4,630,341, Cl. 29-1.300.

Rohner, Joachim, to W. Schlafhorst & Co. Method and apparatus for forming a thread reserve from the thread end of a textile coil. 4,630,782, Cl. 242-18.0EW.

Rohrback, Gilson H.: *See*—
Kowalski, Bruce R.; and Rohrback, Gilson H., 4,631,687, Cl. 364-497.000.

Rohrback Technology Corporation: *See*—
Kowalski, Bruce R.; and Rohrback, Gilson H., 4,631,687, Cl. 364-497.000.

Rolscreen Company: *See*—
Hagemeyer, Bruce A., 4,630,420, Cl. 52-313.000.

Romania, Samuel R.; and Steen, Grant F., to Burroughs Corporation. Dual backplane interconnect system. 4,631,637, Cl. 361-413.000.

Romann, Peter: *See*—
Biermann, Eberhard; Nagele, Erwin; and Romann, Peter, 4,630,487, Cl. 73-861.760.

Romeas, Rene ; Bricot, Claude; and Gerard, Jean-Louis, to Thomson-CSF. Calibration device of the optical power applied to an optical disc for recording of data. 4,631,713, Cl. 369-54.000.

Ronzi, Richard C.: *See*—
Anderson, Richard W.; Asik, Joseph R.; Ronzi, Richard C.; and Simko, Aladar O., 4,631,451, Cl. 315-209.00R.

Roper Corporation: *See*—
Dean, George J., Jr.; Klaeser, Robert S.; and Braa, Lloyd W., 4,630,397, Cl. 49-97.000.

Rosemount Engineering Company Limited: *See*—
Johnston, James S., 4,631,519, Cl. 340-347.00P.

Rosenberg, Jerome C., to Boeing Company, The. Dielectric isolated fuel and hydraulic tubes. 4,630,789, Cl. 244-135.00R.

Ross, John R., Jr. Calorie counting device. 4,631,393, Cl. 235-89.00A.

Ross, Joseph; and DiMatteo, Paul, to Robotic Vision Systems, Inc. Method of measuring in three-dimensions at high speed. 4,630,910, Cl. 354-76.000.

Ross, Rodger L. Soap holder and dispenser. 4,630,794, Cl. 248-309.100.

Rossignol, Francois: *See*—
Hofer, Gerald; Hofmann, Eberhard; Laufer, Helmut; Rossignol, Francois; Schwartz, Reinhard; Straubel, Max; and Tissot, Raymond, 4,630,587, Cl. 123-502.000.

Rostrup-Nielsen, Jens R.: *See*—
Tottrup, Peter B.; and Rostrup-Nielsen, Jens R., 4,631,182, Cl. 423-652.000.

Rothermel, Ronald R., to Dimetrics, Inc. Automated position detectors and welding system utilizing same. 4,631,385, Cl. 219-124.030.

Roto-Finish Company, Inc.: *See*—
McNeil, Gary L., 4,630,401, Cl. 51-7.000.
McNeil, Gary L., 4,630,405, Cl. 51-163.200.

Roux, Jean-Pierre, to Berthiez-Saint-Etienne. Cartridge tool locking and unlocking device for toolholders. 4,630,979, Cl. 409-232.000.

Roxor Corporation: *See*—
Blom, C. James, 4,630,905, Cl. 350-613.000.

Roy, Claude, to L.C.C.-C.I.C.E.-Compagnie Europeenne des Composants Electroniques-36. Process and device for manufacturing mother capacitors by helical winding. 4,630,784, Cl. 242-56.100.
Rozanski, Walt: *See—*
Laird, Kevin M.; and Rozanski, Walt, 4,631,489, Cl. 329-110.000.
RSF Elektronik Gesellschaft m.b.H.: *See—*
Rieder, Heinz; and Schwaiger, Max, 4,631,403, Cl. 250-237.00G.
Ruckle, Duane L.; and Millan, Ponciano P., Jr., to Garrett Corporation, The. Method for heat treating cast titanium articles to improve their mechanical properties. 4,631,092, Cl. 148-3.000.
Rudat, Gerhard: *See—*
Hecht, Joachim; and Rudat, Gerhard, 4,630,544, Cl. 105-130.000.
Rudisill, Carl D., to Cincinnati Milacron Inc. Modular fixturing apparatus. 4,630,811, Cl. 269-118.000.
Rueb, John T.: *See—*
Samuelson, Bruce E.; and Rueb, John T., 4,630,765, Cl. 225-96.000.
Ruehr, Volker: *See—*
Kamprath, Axel; and Ruehr, Volker, 4,630,471, Cl. 73-146.500.
Ruka, Roswell J., to Westinghouse Electric Corp. Cobalt doped lanthanum chromite material suitable for high temperature use. 4,631,238, Cl. 429-30.000.
Runner, James F.: *See—*
Casper, Robert K.; and Runner, James F., 4,631,025, Cl. 432-15.000.
Russell, Angus R. T., to Singer Company, The. Adjustable low inertia presser bar. 4,630,557, Cl. 112-235.000.
Russier, Michel V.: *See—*
Leman, Jean-Luc; Russier, Michel V.; and Suzzi, Robert J., 4,630,998, Cl. 416-134.00A.
Russow, Jurgen: *See—*
Rieck, Hans-Peter; Schott, Martin; and Russow, Jurgen, 4,631,158, Cl. 264-43.000.
Ruttershoff, Heinz-Joachim: *See—*
Heine, Franz; and Ruttershoff, Heinz-Joachim, 4,630,878, Cl. 339-75.00M.
Ryan, John O., to Macrovision. Method and apparatus for processing a video signal so as to prohibit the making of acceptable video tape recordings thereof. 4,631,603, Cl. 360-37.100.
Ryan-Walsh Stevedoring Company, Inc.: *See—*
Parks, Billy W., 4,631,125, Cl. 209-215.000.
Ryser, Hugues J.: *See—*
Shen, Wei C.; and Ryser, Hugues J., 4,631,190, Cl. 424-85.000.
Rzeszewski, Theodore S.: *See—*
LoCicero, Joseph L.; Pazarci, Melih; and Rzeszewski, Theodore S., 4,631,574, Cl. 358-12.000.
S.C. Johnson & Son, Inc.: *See—*
Padden, Timothy J.; and Uick, Heidi J., 4,631,187, Cl. 424-70.000.
S.K.Y. Polymers, Ltd. (Kingston Technologies): *See—*
Stoy, Vladimir A.; and Chvapil, Milos, 4,631,188, Cl. 424-81.000.
S. T. DuPont: *See—*
Grossiord, Claude, 4,630,937, Cl. 368-223.000.
Saarinen, Sulevi, to Tunturipyora Oy. Torque metering device for a bicycle-type ergometer. 4,630,818, Cl. 272-73.000.
Sab Nife AB: *See—*
Stjarne, Olov G.; Severinsson, Lars M.; and Lowrie, Alastair C. B., 4,630,714, Cl. 188-206.00R.
SACHS-Systemtechnik GmbH: *See—*
Lutz, Dieter, 4,630,345, Cl. 29-156.4WL.
Sadamatsu, Hiroshi; Wada, Yoshio; and Ito, Hideaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Transistor switch and driver circuit. 4,631,419, Cl. 307-255.000.
Sadler, Karl O.: *See—*
Franz, Hans-Joachim; Schmidt, Willy; and Sadler, Karl O., 4,630,561, Cl. 114-1.000.
Saegusa, Takashi: *See—*
Maida, Osamu; and Saegusa, Takashi, 4,630,917, Cl. 354-456.000.
Safway Scaffolds Company of Houston: *See—*
Gilbreath, William E., 4,630,956, Cl. 403-49.000.
Sagami Chemical Research Center: *See—*
Umemoto, Teruo; and Ogura, Eiji, 4,631,342, Cl. 544-313.000.
Sagawa, Burt K., to Minnesota Mining and Manufacturing Company. Heat-sensitive composition and imaging sheet incorporating same. 4,631,084, Cl. 106-21.000.
Sagawa, Ryuichi; Nagata, Osamu; and Kajima, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Fuel injection timing control system. 4,630,588, Cl. 123-506.000.
Sage, Dennis R.; and Sage, Monica M. Bathtub liner. 4,630,323, Cl. 4-580.000.
Sage, Monica M.: *See—*
Sage, Dennis R.; and Sage, Monica M., 4,630,323, Cl. 4-580.000.
Sagemuehl, Hans W.; and Duffie, Kenneth G., to H. L. Bouton Company, Inc. Safety spectacles with brow protector. 4,630,321, Cl. 2-426.000.
Saijo, Yoshihiko: *See—*
Okazaki, Takashi; Matsu'ura, Yukio; and Saijo, Yoshihiko, 4,630,353, Cl. 29-564.400.
St. George, Emery, Jr.: *See—*
Drescher, Robert D.; Eisenhaure, David B.; Hockney, Richard L.; Johnson, Bruce G.; St. George, Emery, Jr.; and Whipple, David C., 4,631,456, Cl. 318-140.000.
St. John, Karl M., to Hazeltine Corporation. Nonuniformity correction system for color CRT display. 4,631,576, Cl. 358-65.000.
Saito, Asao, to Citizen Watch Co., Ltd. Closure mechanism. 4,630,751, Cl. 220-334.000.
Saito, Yokuo: *See—*
Tanaka, Katsuyuki; Terashima, Seiichiroo; Takeuchi, Yoshinori; Odaka, Toshiko; and Saito, Yokuo, 4,630,926, Cl. 356-357.000.
Saka, Yoshimi, to Hitachi Metals, LTD. Pipe joint. 4,630,850, Cl. 285-322.000.
Sakabe, Shigekazu: *See—*
Fukunaga, Tokio; Magara, Takuji; Sakabe, Shigekazu; Aramaki, Jun; Karashima, Toshiharu; and Ushida, Minoru, 4,631,382, Cl. 219-69.00R.
Sakai, Fumihide: *See—*
Koshiyama, Hideo; Sakai, Fumihide; and Ohkuma, Hiroaki, 4,631,256, Cl. 435-68.000.
Sakai, Shinji: *See—*
Kinoshita, Takao; and Sakai, Shinji, 4,631,593, Cl. 358-213.000.
Sakakibara, Shiro, to Aisin-Warner Limited. Centrifugal type friction clutch. 4,630,723, Cl. 192-105.0BA.
Sakakiyama, Ryuzo: *See—*
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, 4,630,704, Cl. 180-247.000.
Sakamoto, Koichiro: *See—*
Kitagawa, Tohru; Sakamoto, Koichiro; and Ushijima, Yasuhiro, 4,630,491, Cl. 73-862.670.
Sakamoto, Masaharu: *See—*
Matsubayashi, Nobuhide; Kenjyo, Hideyuki; Kato, Kiichi; and Sakamoto, Masaharu, 4,631,712, Cl. 369-44.000.
Sakamoto, Tsutomu, to Tokyo Shibaura Denki Kabushiki Kaisha. Arithmetic control apparatus for a pipeline processing system. 4,631,672, Cl. 364-200.000.
Sakamoto, Tsutomu, to Tokyo Shibaura Denki Kabushiki Kaisha. Fixed-point data/floating-point data converting apparatus. 4,631,696, Cl. 364-748.000.
Sakamoto, Tsutomu, to Tokyo Shibaura Denki Kabushiki Kaisha. Shift circuit for double word length data. 4,631,703, Cl. 364-900.000.
Sakane, Kazuo: *See—*
Takaya, Takao; Sakane, Kazuo; Yamanaka, Hideaki; and Miyai, Kenzi, 4,631,274, Cl. 514-202.000.
Sakata, Hideo; and Tsunoda, Eiichi, to Mitutoyo Mfg. Co., Ltd. Coordinate measuring instrument. 4,630,381, Cl. 33-503.000.
Sakurada, Nobuaki: *See—*
Sasaki, Takashi; Kawamura, Hideaki; and Sakurada, Nobuaki, 4,631,578, Cl. 358-80.000.
Salazar, Edilberto I.; Kirschner, Wallace; Lorenzo, John L.; Schubert, Keith E.; and Pollak, Philip, Jr., to Pitney Bowes Inc. Microprocessor controlled d.c. motor and application therefor. 4,631,681, Cl. 364-464.000.
Sall, Hans-Olof: *See—*
Arola, Rodger A.; and Sall, Hans-Olof, 4,630,658, Cl. 144-176.000.
Sally, Theodore J.: *See—*
Hafner, V. Walter; Hahn, Ron T.; Marshall, Keith D.; and Sally, Theodore J., 4,630,644, Cl. 137-624.110.
Salpekar, Anil M.; and Johnson, John, to Mallinckrodt, Inc. Acetaminophen compositions containing low doses of chlorpheniramine maleate, method for preparing same and tablets formed therefrom. 4,631,284, Cl. 514-277.000.
Salzer, Heinrich. Explosive action inhibiting glazing. 4,630,411, Cl. 52-1.000.
Sampson, Earl W.: *See—*
Mitchell, Charles B., 4,631,057, Cl. 604-198.000.
Sampson, Norma A.: *See—*
Mitchell, Charles B., 4,631,057, Cl. 604-198.000.
Samuelson, Bruce E.; and Rueb, John T., to Minnesota Minning and Manufacturing Company. Dispenser for tape with a stretchable backing. 4,630,765, Cl. 225-96.000.
Sander, Helfried, to Messrs. Leonhard Kurz GmbH & Co. Embossing foils. 4,631,222, Cl. 428-172.000.
Sander, Helfried, to Messrs. Leonhard Kurz GmbH & Co. Embossing foils having a magnetic layer. 4,631,223, Cl. 428-172.000.
Sanders Associates, Inc.: *See—*
Brodeur, Lester R., 4,631,543, Cl. 342-389.000.
Hollis, Ernest E.; and Born, Joseph H., 4,631,420, Cl. 307-272.00R.
Sanders, Gary G.; and Corwon, Michael E., to Scott & Fetzer Company, The. Digital pointer position detector. 4,631,539, Cl. 340-870.290.
Sandroni, Raffaele: *See—*
Warren, Gerald K.; and Sandroni, Raffaele, 4,631,005, Cl. 417-218.000.
Sangamo Weston, Inc.: *See—*
Randall, Bruce E., 4,631,604, Cl. 360-66.000.
Sanger, Georg; Hietkamp, Gerrit; and Peschka, Walter, to Deutsche Forschungs-und Versuchsanstalt fur Luft-und Raumfahrt E.V. High energy materials containing metastable helium, a process for producing same and applications thereof. 4,631,096, Cl. 149-1.000.
Sankyo Manufacturing Company, Ltd.: *See—*
Kato, Heizaburou, 4,630,493, Cl. 74-22.00R.
Sanner, M. Duane, to Light Signatures, Inc. Authentication document system. 4,630,845, Cl. 283-91.000.
Sano, Shinichi: *See—*
Yamaguchi, Keiki; Higashiizumi, Takao; Shimazaki, Toru; Sano, Shinichi; and Takeuchi, Yasuhito, 4,631,710, Cl. 367-103.000.
Sanofi: *See—*
Kan, Jean-Paul; Biziere, Kathleen; and Wermuth, Camille-Georges, 4,631,280, Cl. 514-247.000.
Sanshin Kogyo Kabushiki Kaisha: *See—*
Iwai, Tomio; and Matsushita, Yukio, 4,630,446, Cl. 60-602.000.
Nakahama, Ryoji, 4,631,035, Cl. 440-61.000.
Santa Barbara Research Center: *See—*
Cinzori, Robert J.; and Kern, Mark T., 4,630,684, Cl. 169-46.000.
Santi, John D., to Briggs & Stratton Corp. Laminated wheel assembly. 4,630,498, Cl. 74-445.000.

Sanyo Electric Co., Ltd.: *See*—
Kan, Yuji, 4,630,653, Cl. 141-83.000.
Nakata, Takeshi, 4,631,406, Cl. 250-338.000.
Sanyo Electric Co., Ltd: *See*—
Kishimoto, Daisaburo, 4,630,451, Cl. 62-247.000.
Sapal Societe Anonyme des Plieuses Automatiques: *See*—
Lesch, Hans-Bernd, 4,630,428, Cl. 53-474.000.
Saphymo Stel: *See*—
Delage, Daniel; and Reboux, Jean, 4,631,381, Cl. 219-10.570.
Sarastro AB: *See*—
Carlsson, Kjell S., 4,631,581, Cl. 358-93.000.
Sartorio, Franco: *See*—
Gilli, Luigi; and Sartorio, Franco, 4,630,992, Cl. 414-744.00R.
Sasaki, Isao; and Schuman, Michael L., to Rainbow Lifegard Products, Inc. Solid chlorine dispenser for spas. 4,630,634, Cl. 137-268.000.
Sasaki, Takashi; Kawamura, Hideaki; and Sakurada, Nobuaki, to Canon Kabushiki Kaisha. Method of and apparatus for forming a color picture using a plurality of color correction processings. 4,631,578, Cl. 358-80.000.
Sasashige, Hiroaki: *See*—
Hirakawa, Tadashi; Yoshikawa, Kiyomitsu; Yoshioka, Shigenari; and Sasashige, Hiroaki, 4,631,109, Cl. 156-472.000.
Sato, Atsushi: *See*—
Kano, Masafumi; Tanaka, Megumu; Sato, Atsushi; and Kawakami, Shigenobu, 4,631,632, Cl. 361-315.000.
Sato, Fumio: *See*—
Kurihara, Mitsuo; Sato, Fumio; Iwasawa, Yoshiyuki; Koibuchi, Nobutaka; and Harada, Hiroshi, 4,631,076, Cl. 55-283.000.
Sato, Goro; Ogata, Masamitsu; and Ida, Takanori, to Catalysts & Chemicals Industries Co., Ltd. Method for preparing hydrocarbon catalytic cracking catalyst compositions. 4,631,261, Cl. 502-65.000.
Sato, Maki, to Sony Corporation. Charge transfer device for forming desired color difference signals. 4,631,575, Cl. 358-30.000.
Sato, Norikatsu: *See*—
Isobe, Susumu; Matsunaga, Kenkichi; Takagi, Yoshiaki; and Sato, Norikatsu, 4,631,169, Cl. 420-443.000.
Satoh, Masaharu, to Sharp Kabushiki Kaisha. Battery charging circuit for electronic apparatus. 4,631,468, Cl. 320-14.000.
Sauermann, Gerhard: *See*—
Engel, Walter; Hoppe, Udo; and Sauermann, Gerhard, 4,631,295, Cl. 514-558.000.
Sauerwein, Kurt; Kinzer, Norbert; and Weinlich, Karl, to Sauerwein, Kurt. Radiation treatment apparatus. 4,631,415, Cl. 250-497.100.
Sawada, Hideo: *See*—
Kobayashi, Michio; Yoshida, Masato; Sawada, Hideo; Hagii, Hidehiko; and Aoshima, Kazuyoshi, 4,631,151, Cl. 260-408.000.
Sawaki, Yasushi; Iguchi, Hironori; and Shimizu, Tateshi, to Suzuki Motor Co., Ltd. Oil passage usable for an engine. 4,630,580, Cl. 123-196.00R.
Sayler, William H.; and White, Justin C., to T.A.S., Inc. Pulverized solid fuel burner and method of firing pulverized fuel. 4,630,554, Cl. 110-264.000.
Scaletron, Inc.: *See*—
Hartman, Russell D.; and Dougherty, Edward M., 4,630,697, Cl. 177-211.000.
Scarafile, Cosimo: *See*—
Battistini, Carlo; Foglio, Maurizio; Franceschi, Giovanni; and Scarafile, Cosimo, 4,631,150, Cl. 540-310.000.
Schaaf, Heinz; and Walter, Horst, to Convent Knabber-Geback GmbH & Co. Cooking extruder. 4,630,533, Cl. 99-353.000.
Schabowski, John: *See*—
Hayn, John, II; and Schabowski, John, 4,631,659, Cl. 364-200.000.
Schade, Reinhart: *See*—
Edinger, Egon; and Schade, Reinhart, 4,631,436, Cl. 310-322.000.
Schaefer, Rolf; and Walker, Haywood A., Jr. Latent imaging and developer system. 4,631,203, Cl. 427-145.000.
Schaeferling, Karl-Josef: *See*—
Erhardt, Manfred; Loos, Herbert; Lohrer, Josef; Schapp, Udo; Schaeferling, Karl-Josef; and Freundl, Walter, 4,630,402, Cl. 51-105.0GG.
Schaller, Klaus: *See*—
Lockhoff, Oswald; Kruger, Bernd-Wieland; Stadler, Peter; Metzger, Karl G.; Kroll, Hein-Peter; Schaller, Klaus; and Zeiler, Hans-Joachim, 4,631,272, Cl. 514-23.000.
Schapp, Udo: *See*—
Erhardt, Manfred; Loos, Herbert; Lohrer, Josef; Schapp, Udo; Schaeferling, Karl-Josef; and Freundl, Walter, 4,630,402, Cl. 51-105.0GG.
Schatz, Oskar. Internal combustion engine with a combination exhaust and direct drive supercharger. 4,630,444, Cl. 60-598.000.
Schaudt Maschinenbau GmbH: *See*—
Belthle, Heinz, 4,630,403, Cl. 51-105.0VG.
Scheffee, Robert S., to Atlantic Research Corporation. Method for burning coal-liquid slurry fuels and apparatus therefor. 4,630,556, Cl. 110-347.000.
Scheibli, Peter: *See*—
Seitz, Karl; Scheibli, Peter; and Seiler, Herbert, 4,631,065, Cl. 8-549.000.
Schering Aktiengesellschaft: *See*—
Petersen, Erling N.; Jensen, Leif H.; Watjen, Frank; and Seidelmann, Dieter, 4,631,285, Cl. 514-292.000.
Vorbruggen, Helmut; Elger, Walter; Town, Michael-Harold; and Schillinger, Ekkehard, 4,631,276, Cl. 514-211.000.
Scherrer, Alain: *See*—
Rohmer, Daniel; and Scherrer, Alain, 4,630,341, Cl. 29-1.300.
Schiavone, Frank J., to United States of America, Navy. Right angle microwave stripline circuit connector. 4,631,505, Cl. 333-33.000.
Schiller, Norman H.; and Alfano, Robert R., to Hamamatsu Corp. Compact temporal spectral photometer. 4,630,925, Cl. 356-318.000.
Schillinger, Ekkehard: *See*—
Vorbruggen, Helmut; Elger, Walter; Town, Michael-Harold; and Schillinger, Ekkehard, 4,631,276, Cl. 514-211.000.
Schitzler, Lorenz: *See*—
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Schlicht, Gunther: *See*—
Altenheiner, Erwin; Schlicht, Gunther; and Hornschu, Joachim, 4,630,901, Cl. 350-552.000.
Schlueter, Francis E.; and Schreiner, Joel M., to Deere & Company. Combination platform and shield for an implement. 4,630,431, Cl. 56-28.000.
Schmedemann, Walter: *See*—
Kayser, Harald; and Schmedemann, Walter, 4,630,796, Cl. 248-648.000.
Schmid, Rene: *See*—
Verzilli, Giuseppe; and Schmid, Rene, 4,630,337, Cl. 19-296.000.
Schmidt, Glenn H.; Schmidt, Howard F.; and Seidman, Glenn R., to Schmidt, Glenn H. Golf clubs. 4,630,825, Cl. 273-167.00H.
Schmidt, Hans W.: *See*—
Ringsdorf, Helmut; Portugall, Michael; Schmidt, Hans W.; and Etzbach, Karl H., 4,631,328, Cl. 526-259.000.
Schmidt, Howard F.: *See*—
Schmidt, Glenn H.; Schmidt, Howard F.; and Seidman, Glenn R., 4,630,825, Cl. 273-167.00H.
Schmidt, Manfred; Trube, Hans; and Grimm, Hermann, to Daimler-Benz Aktiengesellschaft. Single-arm windshield wiper for motor vehicles. 4,630,327, Cl. 15-250.210.
Schmidt, Rolf: *See*—
Forker, Dieter; Hassler, Joachim; Lau, Bernhard; and Schmidt, Rolf, 4,630,909, Cl. 354-1.000.
Schmidt, Thomas D.: *See*—
Bambousek, Gerald J.; Bartlett, Donald S.; and Schmidt, Thomas D., 4,630,567, Cl. 118-323.000.
Schmidt, Willy: *See*—
Franz, Hans-Joachim; Schmidt, Willy; and Sadler, Karl O., 4,630,561, Cl. 114-1.000.
Schneider, Guenter, to Digital Equipment Corporation. Read/write head positioner arrangement. 4,631,611, Cl. 360-106.000.
Schneider, Hartmut, to Siemens Aktiengesellschaft. Method for removing a surface layer from a metal fluoride glass. 4,631,114, Cl. 156-663.000.
Schneider, Michael H.; and Chadwell, Thomas J., to Sunnen Products Company. Valve seat runout gage. 4,630,377, Cl. 33-181.0AT.
Schoenung, Bernhard: *See*—
Hartmannsgruber, Max; von Ronai-Horvath, Michael; Seebo, Kurt; and Schoenung, Bernhard, 4,630,434, Cl. 57-87.000.
Scholer, Fred R.: *See*—
Braksmayer, Diza P.; Lee, Fui-Tseng H.; and Scholer, Fred R., 4,631,148, Cl. 252-609.000.
Schoon, David J., to Minnesota Mining and Manufacturing Company. Laser diode control circuitry. 4,631,726, Cl. 372-31.000.
Schopwinkel, Theo; and Weber, Wilfried, to Trutzschler GmbH & Co. KG. Apparatus for gathering a fiber web into a sliver in a carding machine. 4,630,336, Cl. 19-288.000.
Schorr, Wolfgang: *See*—
Nickel, Bernd; and Schorr, Wolfgang, 4,631,477, Cl. 324-207.000.
Schott, Martin: *See*—
Rieck, Hans-Peter; Schott, Martin; and Russow, Jurgen, 4,631,158, Cl. 264-43.000.
Schrader Bellows Inc.: *See*—
Johnson, John L., 4,630,632, Cl. 137-85.000.
Schreckenberg, Manfred: *See*—
Blahak, Johannes; Dhein, Rolf; Preis, Lothar; and Schreckenberg, Manfred, 4,631,319, Cl. 525-437.000.
Schreiber, Winfried: *See*—
Keller, Manfred; Kolle, Rudi; Schreiber, Winfried; and Claar, Klaus, 4,630,330, Cl. 16-2.000.
Schreiner, Joel M.: *See*—
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Schubert, Keith E.: *See*—
Salazar, Edilberto I.; Kirschner, Wallace; Lorenzo, John L.; Schubert, Keith E.; and Pollak, Philip, Jr., 4,631,681, Cl. 364-464.000.
Schultz, Cheri L.: *See*—
Lassen, Frederich O.; Peerenboom, Robert J.; and Schultz, Cheri L., 4,631,062, Cl. 604-385.00R.
Schulz, Klaus M.: *See*—
Eibach, Wolfgang; Roehr, Kuno M.; and Schulz, Klaus M., 4,631,661, Cl. 364-200.000.
Schuman, Michael L.: *See*—
Sasaki, Isao; and Schuman, Michael L., 4,630,634, Cl. 137-268.000.
Schussler, Karl H. Process for the intermittent aeration of liquids and aeration device for use in such process. 4,631,134, Cl. 210-758.000.
Schust, Gerhard, to Brose Fahrzeugteile GmbH. Arrangement for lifting and lowering a windowpane, especially of a motor vehicle window. 4,630,398, Cl. 49-352.000.
Schwaiger, Max: *See*—
Rieder, Heinz; and Schwaiger, Max, 4,631,403, Cl. 250-237.00G.
Schwartz, Mark A.: *See*—
Grossman, Craig B.; Schwartz, Mark A.; and Hammer, Stanley S., 4,631,615, Cl. 360-128.000.

Schwartz, Reinhard: *See—*
Hofer, Gerald; Hofmann, Eberhard; Laufer, Helmut; Rossignol, Francois; Schwartz, Reinhard; Straubel, Max; and Tissot, Raymond, 4,630,587, Cl. 123-502.000.
Schwinn Bicycle Company: *See—*
Greco, Mark, 4,630,502, Cl. 74-551.100.
Sciulli, Ronald D.: *See—*
Grant, Richard W.; and Sciulli, Ronald D., 4,630,562, Cl. 114-39.000.
Scola, Daniel A.; and Pater, Ruth H., to United Technologies Corporation. Polyimide of alkylene diamine and 4,4'(hexafluoroisopropylidene)bis(o-phthalic anhydride). 4,631,335, Cl. 528-353.000.
Scott & Fetzer Co., The: *See—*
Keech, David W., 4,631,001, Cl. 417-3.000.
Sanders, Gary G.; and Corwon, Michael E., 4,631,539, Cl. 340-870.290.
Scranton, Robert A.: *See—*
Chainer, Timothy J.; Scranton, Robert A.; and Thompson, David A., 4,630,941, Cl. 384-1.000.
Scripps Clinic & Research Foundation: *See—*
Houghten, Richard A., 4,631,211, Cl. 428-35.000.
Seaman, A. Matthew: *See—*
Fyfe, Leo W.; and Seaman, A. Matthew, 4,630,364, Cl. 29-779.000.
Seebo, Kurt: *See—*
Hartmannsgruber, Max; von Ronai-Horvath, Michael; Seebo, Kurt; and Schoenung, Bernhard, 4,630,434, Cl. 57-87.000.
Seelbach, Walter C.: *See—*
Birrittella, Mark S.; Reuss, Robert H.; and Seelbach, Walter C., 4,631,570, Cl. 357-49.000.
Seibentritt, Carl R., Jr.: *See—*
Kronenberg, Stanley; McLaughlin, William L.; and Seibentritt, Carl R., Jr., 4,631,414, Cl. 250-474.100.
Seidelmann, Dieter: *See—*
Petersen, Erling N.; Jensen, Leif H.; Watjen, Frank; and Seidelmann, Dieter, 4,631,285, Cl. 514-292.000.
Seidman, Glenn R.: *See—*
Schmidt, Glenn H.; Schmidt, Howard F.; and Seidman, Glenn R., 4,630,825, Cl. 273-167.00H.
Seikensha Co., Ltd.: *See—*
Tsuchiya, Kanji; and Ono, Shizumi, 4,630,534, Cl. 99-483.000.
Seikosha Co., Ltd.: *See—*
Mizutani, Seiki; Hayashi, Mikio; and Ikeda, Kazuaki, 4,630,946, Cl. 400-121.000.
Seiler, Herbert: *See—*
Seitz, Karl; Scheibli, Peter; and Seiler, Herbert, 4,631,065, Cl. 8-549.000.
Seiling, Samuel O., to AMF Union Machinery Inc. High speed batch mixer. 4,630,930, Cl. 366-77.000.
Seitz, Karl; Scheibli, Peter; and Seiler, Herbert, to Ciba-Geigy Corporation. Reactive dyes, process for their preparation and use thereof. 4,631,065, Cl. 8-549.000.
Sekiya, Takuro, to Ricoh Company, Ltd. Printer head of an ink-jet printer. 4,631,553, Cl. 346-140.00R.
Selkirk Division of Household Manufacturing Limited: *See—*
Attwell, Ronald L., 4,630,415, Cl. 52-221.000.
Semperit Reifen AG: *See—*
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Senco Products, Inc.: *See—*
Steeves, Jay M.; and Cotta, Gilbert A., 4,630,766, Cl. 227-8.000.
Send, Dietmar: *See—*
Hirt, Edmund; Send, Dietmar; and Diete, Gunter, 4,630,729, Cl. 206-363.000.
Senda, Kenichi: *See—*
Maeda, Hirofumi; Watanabe, Kazuyoshi; Akamatsu, Naruhiko; Senda, Kenichi; and Nishioka, Shunichi, 4,631,159, Cl. 264-53.000.
Senelco Limited: *See—*
Wood, David H.; and Creswick, Martin, 4,631,708, Cl. 367-2.000.
Senese, Frank J.; and Baillie, Lloyd A. Leak detector. 4,630,467, Cl. 73-49.200.
Seol, Marn T., to Alenax Corp. Propulsion mechanism for lever propelled bicycles. 4,630,839, Cl. 280-255.000.
Seremjian, Carmella M. Device for holding interim crochet stitches against unravelling. 4,630,454, Cl. 66-1.00A.
Serikawa, Atsuo: *See—*
Takato, Kenji; Ayano, Mitsutoshi; Shibuya, Kiyoshi; Iijima, Yoshimi; and Serikawa, Atsuo, 4,631,366, Cl. 340-333.000.
Serlin, Victor: *See—*
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Serravalle, Joseph M., Jr., to Sony Corporation. Digital fader or like device. 4,631,525, Cl. 340-365.00S.
Severin, Eric; Jansson, Arne; and Ostman, Kjell, to AB Jonkoping Vulcan. Package for hanging or stand-up display. 4,630,734, Cl. 206-461.000.
Severinsson, Lars M.: *See—*
Stjarne, Olov G.; Severinsson, Lars M.; and Lowrie, Alastair C. B., 4,630,714, Cl. 188-206.00R.
Sewell Plastics, Inc.: *See—*
Frankenberg, Robert E.; and Calderazzo, Mark A., 4,631,020, Cl. 425-527.000.
SGS-ATES Componenti Elettronici S.p.A.: *See—*
Torelli, Guido; and Daniele, Vincenzo, 4,631,485, Cl. 329-50.000.
SGS-ATES Componenti Elettronici SpA: *See—*
Foroni, Mario; and Bertotti, Franco, 4,631,561, Cl. 357-13.000.
Shah, Chandrakant K., to Avondale Industries, Inc. Hydraulic drive apparatus for die carriers. 4,630,536, Cl. 100-229.00R.
Shallenberger, John M.; and Ferlan, Stephen J., to Westinghouse Electric Corp. Nuclear reactor fuel assembly with a removable top nozzle. 4,631,168, Cl. 376-446.000.
Shanzer, Abraham; and Libman, Jacqueline, to Yeda Research & Development Co. Limited. Enterobactin type compounds. 4,631,291, Cl. 514-450.000.
Sharon Manufacturing Company: *See—*
Hudson, Sharon J., Jr., 4,630,439, Cl. 60-305.000.
Sharp Kabushiki Kaisha: *See—*
Hara, Takafumi, 4,631,558, Cl. 346-140.00R.
Mizoguchi, Saburo, 4,630,475, Cl. 73-293.000.
Satoh, Masaharu, 4,631,468, Cl. 320-14.000.
Yoshida, Kunio; and Makino, Fusao, 4,630,947, Cl. 400-124.000.
Yui, Yuhi; and Kinashi, Hiroshi, 4,630,918, Cl. 355-3.00R.
Shaulov, Avner A.; Lukasik, Stanley J.; Frommer, Myron H.; and Zwicker, Walter K., to North American Philips Corporation. Thin film capacitors and method of making the same. 4,631,633, Cl. 361-321.000.
Sheffer, Phil B., to Merchandising Innovations, Inc. Structural locking device. 4,630,549, Cl. 108-111.000.
Sheffer, Phil B., to Merchandising Innovations, Inc. Executive desk. 4,630,551, Cl. 108-159.000.
Shen, Wei C.; and Ryser, Hugues J. Acidity-sensitive spacer molecule to control the release of pharmaceuticals from molecular carriers. 4,631,190, Cl. 424-85.000.
Shepherd, Clay: *See—*
Tamura, Hifumi; Shepherd, Clay; Ishitani, Toru; and Umemura, Kaoru, 4,631,448, Cl. 315-111.810.
Shepherd, Robert A., Jr.: *See—*
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Sherard, Michael W. Subirrigation gravel culture growing bed. 4,630,394, Cl. 47-59.000.
Sherman, James L., to Price & Adams. Roof support system for a mine and method for providing the same. 4,630,974, Cl. 405-288.000.
Sherman, Victor; and Zborovsky, Ilya. Lunch box. 4,630,671, Cl. 165-61.000.
Sherwin, Gary W., to Westinghouse Electric Corp. Phase locked stepper motor controlled light chopper. 4,631,466, Cl. 318-696.000.
Shiba, Haruo: *See—*
Hashizume, Kenji; Shiba, Haruo; and Okamura, Masatoshi, 4,631,619, Cl. 360-132.000.
Shibahara, Tetsuya: *See—*
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Shibata, Fumio: *See—*
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Shibata, Makoto: *See—*
Ikeda, Masami; Shibata, Makoto; Matsuda, Hiroto; and Takahashi, Hiroto, 4,631,555, Cl. 346-140.00R.
Shibata, Norio, to Toyota Jidosha Kabushiki Kaisha. System for controlling vaporized fuel in an internal combustion engine. 4,630,581, Cl. 123-325.000.
Shibata, Tadashi: *See—*
Ikawa, Yasuo; Shibata, Tadashi; Urui, Kiyoshi; Miyata, Misao; Kawamura, Masahiko; and Amano, Noboru, 4,631,686, Cl. 364-490.000.
Shibata, Tsuneo; Mohri, Yoshitaka; Ida, Haruo; and Ishikawa, Haruo, to Matsushita Electric Industrial Co., Ltd. Catalytic combustion device. 4,631,024, Cl. 431-268.000.
Shibuya, Kiyoshi: *See—*
Takato, Kenji; Ayano, Mitsutoshi; Shibuya, Kiyoshi; Iijima, Yoshimi; and Serikawa, Atsuo, 4,631,366, Cl. 340-333.000.
Shifflett, David C.; and Shifflett, Dennis I., to Al-Ko Products, Inc. Manifold. 4,631,212, Cl. 428-36.000.
Shifflett, Dennis I.: *See—*
Shifflett, David C.; and Shifflett, Dennis I., 4,631,212, Cl. 428-36.000.
Shigematsu, Takashi: *See—*
Tokoro, Setsuo; Shigematsu, Takashi; and Watanabe, Tomoyuki, 4,631,043, Cl. 474-18.000.
Shigeo, Iwasaki; and Hiroshi, Haguchi, to Mitsuiahi Fukai Tekkosho, Ltd. Molding apparatus with replaceable plunger and die set. 4,631,015, Cl. 425-195.000.
Shiiki, Kazuo; Shiroishi, Yoshihiro; Yuito, Isamu; Shinagawa, Kiminari; Uesaka, Yasutaro; Fujiwara, Hideo; and Nakamura, Hitoshi. Magnetic recording and reproducing system. 4,631,612, Cl. 360-125.000.
Shimada, Masaru: *See—*
Kawanishi, Toshiyuki; Shimada, Masaru; Murakami, Kakuji; Aruga, Tamotsu; and Uemura, Hiroyuki, 4,631,085, Cl. 106-22.000.
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Shimizu Construction Co., Ltd.: *See—*
Kurihara, Mitsuo; Sato, Fumio; Iwasawa, Yoshiyuki; Koibuchi, Nobutaka; and Harada, Hiroshi, 4,631,076, Cl. 55-283.000.
Shimizu, Keiji: *See—*
Watanabe, Kainen; Yasuhara, Hiroto; Sugiyama, Toru; Shimizu, Keiji; and Murata, Yoshihiro, 4,630,772, Cl. 238-159.000.
Shimizu, Masao, to Advantest Corp. Semiconductor memory test equipment. 4,631,724, Cl. 371-21.000.

Shimizu, Tateshi: *See*—
Sawaki, Yasushi; Iguchi, Hironori; and Shimizu, Tateshi, 4,630,580, Cl. 123-196.00R.
Shinagawa, Kiminari: *See*—
Shiiki, Kazuo; Shiroishi, Yoshihiro; Yuito, Isamu; Shinagawa, Kiminari; Uesaka, Yasutaro; Fujiwara, Hideo; and Nakamura, Hitoshi, 4,631,612, Cl. 360-125.000.
Shinobu, Masayoshi: *See*—
Imabayashi, Koji; Kawamura, Hiroshi; Takeuchi, Shigeru; Shinobu, Masayoshi; and Kawajiri, Shinobu, 4,631,594, Cl. 358-231.000.
Shinoda, Yoshio: *See*—
Yamamoto, Ikuo; Umino, Takehito; Shinoda, Yoshio; and Yoshino, Hisao, 4,631,172, Cl. 420-541.000.
Shinzawa, Motohiro, to Nissan Motor Company, Limited. Exhaust particle removing system for an engine. 4,630,438, Cl. 60-274.000.
Shiotani, Yosuke, to Kunimori Kagaku Co., Ltd. Foldable containers. 4,630,745, Cl. 220-6.000.
Shiraishi, Masami, to Tomy Kogyo Co., Inc. Construction toy set. 4,631,040, Cl. 446-95.000.
Shirley, Chester L. Lug wrench support tool. 4,630,511, Cl. 81-462.000.
Shiroishi, Yoshihiro: *See*—
Shiiki, Kazuo; Shiroishi, Yoshihiro; Yuito, Isamu; Shinagawa, Kiminari; Uesaka, Yasutaro; Fujiwara, Hideo; and Nakamura, Hitoshi, 4,631,612, Cl. 360-125.000.
Shoemaker, John R.: *See*—
Renn, Robert M.; and Shoemaker, John R., 4,630,874, Cl. 339-17.00F.
Shores, Stephen. Vacuum assisted flea combing device. 4,630,329, Cl. 15-368.000.
Showa Denko Kabushiki Kaisha: *See*—
Hoshi, Katsumasa, 4,630,348, Cl. 29-234.000.
Showa Musen Kogyo Kabushiki Kaisha: *See*—
Matsuda, Takeshi; and Kano, Harumi, 4,631,504, Cl. 333-25.000.
Shurman, Louis W.: *See*—
Bell, Thomas W.; and Shurman, Louis W., 4,630,663, Cl. 152-541.000.
Shutske, Gregory M.; and Pierrat, Frank A., to Hoechst-Roussel Pharmaceuticals Inc. 9-amino-1,2,3,4-tetrahydroacridin-1-ol and related compounds. 4,631,286, Cl. 514-297.000.
Sickler, Janet M.: *See*—
Christie, Rosemary; Hwang, Bao-Tai; Ku, San-Mei; and Sickler, Janet M., 4,630,356, Cl. 29-576.00W.
Siebe North, Inc.: *See*—
Montesi, Edward N., 4,630,604, Cl. 128-206.150.
Siemens Aktiengesellschaft: *See*—
Edinger, Egon; and Schade, Reinhart, 4,631,436, Cl. 310-322.000.
Haberrecker, Klaus, 4,631,744, Cl. 378-138.000.
Markert, Helmut; Hauschildt, Klaus-Robert; Rogler, Wolfgang; and Kretzschmar, Klaus, 4,631,306, Cl. 523-457.000.
Milbrandt, Artur, 4,631,548, Cl. 346-1.100.
Nickel, Bernd; and Schorr, Wolfgang, 4,631,477, Cl. 324-207.000.
Poersch, Hans; and Stark, Gustav, 4,630,987, Cl. 414-32.000.
Schneider, Hartmut, 4,631,114, Cl. 156-663.000.
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Siemens Energy & Automation, Inc.: *See*—
Alexander, James O.; King, William A.; May, William E.; and Pardue, Von G., 4,631,625, Cl. 361-94.000.
Siewert, Robert L.; and Varnelis, Edmund K., to Clark Michigan Company. Self-storing side panel. 4,630,698, Cl. 180-69.240.
Sigel, George H.: *See*—
Taylor, Henry F.; Sigel, George H.; and Gingerich, Michael E., 4,630,883, Cl. 350-96.150.
Signetics Corporation: *See*—
Donald, Raymond G., 4,631,113, Cl. 156-659.100.
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Jensen, Svend A. K.; Munck, Lars; Sigsgaard, Poul; and Huss, Hans H., 4,631,413, Cl. 250-458.100.
Silverberg, Mort; Maus, Richard G.; and Lindblad, Nero R., to Xerox Corporation. Blade cleaning apparatus for removing residual toner from a charge retentive surface. 4,630,920, Cl. 355-15.000.
Sim-Tech Limited: *See*—
McCallister, John S., 4,630,958, Cl. 403-257.000.
Simbille, Nadine: *See*—
Combourieu, Michel; Bernet, Yvon; Laigle, Jean-Claude; and Simbille, Nadine, 4,631,277, Cl. 514-239.000.
Simko, Aladar O.: *See*—
Anderson, Richard W.; Asik, Joseph R.; Ronzi, Richard C.; and Simko, Aladar O., 4,631,451, Cl. 315-209.00R.
Simon, Myron S.; and Waller, David P., to Polaroid Corporation. Photographic products and processes. 4,631,344, Cl. 548-146.000.
Simons, Brent S., to United States of America, Navy. Thermoelectric cooler control circuit. 4,631,728, Cl. 372-38.000.
Simons, Leon. Self aligning screw. 4,630,985, Cl. 411-386.000.
Simpson, John A.; Melton, Keith; and Duerig, Tom, to Raychem Corporation. Method of processing a nickel/titanium-based shape memory alloy and article produced therefrom. 4,631,094, Cl. 148-11.50F.
Singer Company, The: *See*—
Russell, Angus R. T., 4,630,557, Cl. 112-235.000.
Singer, Steven M. Article forming method. 4,630,346, Cl. 29-160.600.
Singerman, Harold H.: *See*—
Supcoe, Robert F.; Singerman, Harold H.; and Whitacre, Jack E., 4,631,303, Cl. 523-177.000.
Single, Peter S., to National Semiconductor Corporation. Sine wave synthesizer. 4,631,694, Cl. 364-608.000.
Sipido, Victor: *See*—
Boeckx, Gustaaf M.; Raeymaekers, Alfons H. M.; and Sipido, Victor, 4,631,278, Cl. 514-242.000.
Siwik, James C.; Murray, Thomas L., Jr.; and Holtey, Thomas O., to Honeywell Information Systems Inc. Firmware simulation of diskette data via a video signal. 4,631,699, Cl. 364-900.000.
Skanaker, Ragnar: *See*—
Crane, James W.; and Skanaker, Ragnar, 4,630,387, Cl. 42-73.000.
SKF Textilmaschinen-Komponenten GmbH: *See*—
Hartmannsgruber, Max; von Ronai-Horvath, Michael; Seebo, Kurt; and Schoenung, Bernhard, 4,630,434, Cl. 57-87.000.
Skoog, Malte, to Malte Skoog Invent Ab. Plate heat exchanger. 4,630,674, Cl. 165-147.000.
Slavens, Clyde M. Welding head apparatus. 4,631,386, Cl. 219-125.120.
Slavin, Lawrence M.: *See*—
Lauriello, Philip J. J.; and Slavin, Lawrence M., 4,630,886, Cl. 350-96.200.
Sliger, Boyd P.; and Wagner, Joseph P., to Robertshaw Controls Company. Valve construction and method of making the same. 4,630,770, Cl. 236-34.500.
Slusarski, Ronald S.: *See*—
Handel, Martin G.; Robida, James E.; and Slusarski, Ronald S., 4,631,528, Cl. 340-545.000.
Small, Kenneth T., to Boschert Incorporated. Capacitor coupled current mode balance circuit. 4,631,653, Cl. 363-17.000.
Smilgys, Bruno S.: *See*—
Fleischer, Donald W.; and Smilgys, Bruno S., 4,630,655, Cl. 141-198.000.
Smiri, Richard L., to Borg-Warner Corporation. Dual-pass continuously variable transmission. 4,630,504, Cl. 74-689.000.
Smith, Dolores A.: *See*—
Mitchell, Charles B., 4,631,057, Cl. 604-198.000.
Smith, Eric T.: *See*—
Baker, Ralph; Smith, Eric T.; Dickinson, Vaughan T.; McKenzie, Noel C.; and Hargreaves, Brian, 4,631,209, Cl. 427-392.000.
Smith, Gregory J.: *See*—
Naylor, Herbert C.; Smith, Gregory J.; and Roeser, Howard J., Jr., 4,630,882, Cl. 339-198.00R.
Smith, Harry D., Jr., to Halliburton Company. Method and apparatus for dual-spaced fast/epithermal neutron porosity measurements. 4,631,405, Cl. 250-266.000.
Smith International Inc.: *See*—
Neipling, Lawrence E.; and Flohr, Mark C., 4,630,675, Cl. 166-53.000.
Smith, James C.: *See*—
Rehman, William R.; and Smith, James C., 4,630,774, Cl. 239-8.000.
Smith, James D. B.: *See*—
Ray, John R.; Williamson, Michael A.; and Smith, James D. B., 4,631,325, Cl. 526-220.000.
Smith, James E.: *See*—
Franklin, Andrew D.; Hasley, Lloyd A.; and Smith, James E., 4,631,534, Cl. 340-825.500.
Smith, John D., to Fairey Hydraulics Limited. Variable ratio power transmission means. 4,630,495, Cl. 74-191.000.
Smith, John M.: *See*—
Miles, James J.; and Smith, John M., 4,630,486, Cl. 73-861.560.
Smith, Stephen R.: *See*—
Lanham, William E.; and Smith, Stephen R., 4,631,029, Cl. 432-133.000.
Smith, Troy L., Jr., to Ethyl Corporation. Process for the production of silicon carbide by the pyrolysis of a polycarbosilane polymer. 4,631,179, Cl. 423-345.000.
Smithers, Colin R., to U.S. Philips Corporation. Bipolar transistor RF power amplifier. 4,631,491, Cl. 330-149.000.
Smoot, George W.: *See*—
Davis, Walter L.; Prieto, Yolanda; and Smoot, George W., 4,631,737, Cl. 375-88.000.
Snelgrove, Roy V.: *See*—
McCullough, Francis P.; and Snelgrove, Roy V., 4,631,118, Cl. 204-16.000.
Snell, James L., to Harris Corporation. M-phase PSK vector processor demodulator. 4,631,486, Cl. 329-50.000.
Snyman, Robert. Storage device for storing disc-shaped articles. 4,630,732, Cl. 206-445.000.
Sobus, Michael T., to PQ Corporation. Treating beer to prevent chill haze. 4,631,193, Cl. 426-330.400.
Societe A. Degut: *See*—
Degut, Andre, 4,630,418, Cl. 52-264.000.
Societe Anonyme D.B.A.: *See*—
Carre, Jean-Jacques; Thioux, Alain; and Mery, Jean-Claude, 4,630,713, Cl. 188-73.440.
Levrai, Roland; Courbot, Pierre; and Picot, Pascal, 4,630,711, Cl. 184-6.120.
Societe Mte: *See*—
Gaudiau, Gaston, 4,630,807, Cl. 267-140.100.
Societe Nationale Elf Aquitaine (Production): *See*—
Sturtz, Georges, 4,631,142, Cl. 252-184.000.
Soil Teq., Inc.: *See*—
Ortlip, Earl W., 4,630,773, Cl. 239-1.000.
Solomon, Stephen R.: *See*—
Sudol, George A.; Comfort, Edward H.; and Solomon, Stephen R., 4,631,608, Cl. 360-99.000.
Soltau, Gerd. Arrangement for underground advance driving of pipe trains composed of individual pipe lengths. 4,630,967, Cl. 405-184.000.

Somat Corporation: *See—*
Immel, Robert W.; and Fields, Evan P., 4,630,780, Cl. 241-46.00B.
Sonnentag, Kurt J.; and Steinkamp, Norman A., to John Zink Company. Coffeemaker. 4,630,532, Cl. 99-279.000.
Sony Corporation: *See—*
Hongu, Masayuki; Tamura, Takahiko; and Tokuhara, Masaharu, 4,631,589, Cl. 358-171.000.
Katsumata, Hiroshi, 4,631,607, Cl. 360-96.500.
Maeda, Satoru, 4,631,531, Cl. 340-701.000.
Nishigaki, Susumu; Ohkoshi, Akio; and Aozuka, Torao, 4,630,826, Cl. 273-167.00H.
Ohsato, Kiyoshi; and Kubota, Shigeo, 4,631,397, Cl. 250-201.000.
Ozawa, Kazuo; and Nonoyama, Hideki, 4,631,618, Cl. 360-132.000.
Sato, Maki, 4,631,575, Cl. 358-30.000.
Serravalle, Joseph M., Jr., 4,631,525, Cl. 340-365.00S.
Sopory, Umesh K.: *See—*
O'Brien, Michael T.; Sopory, Umesh K.; and Fang, Shou-Mean, 4,631,392, Cl. 219-549.000.
Sortex Limited: *See—*
Maughan, William S.; and Fraenkel, Herbert, 4,630,736, Cl. 209-587.000.
Southco, Inc.: *See—*
Bisbing, Robert H., 4,630,332, Cl. 16-273.000.
Vickers, James H., 4,630,333, Cl. 16-338.000.
Spa, Lambertus K. J., to Beta B.V. Pneumatic switching device, e.g., for safeguarding against overpressure. 4,630,645, Cl. 137-625.600.
Spaller, Albert E., to Eastman Kodak Company. Apparatus for cutting continuous strand. 4,630,515, Cl. 83-402.000.
Sparacia, Frank M.; and Wimer, Oley D., to Harshaw/Filtrol. Scintillator crystal having a highly reflective surface. 4,631,409, Cl. 250-361.00R.
Spence, John H.: *See—*
Przybylinski, Phillip G.; and Spence, John H., 4,630,547, Cl. 105-416.000.
Spencer, Treesa; and Alberta, Terry, to Pro-Tec Sports, Inc. Ankle brace and protector. 4,630,600, Cl. 128-80.00R.
Sperakis, Thomas A.: *See—*
McDonald, Allen S.; Philp, Charles W.; and Sperakis, Thomas A., 4,631,171, Cl. 420-481.000.
Sperry Corporation: *See—*
Feldman, Alan, 4,631,540, Cl. 340-870.380.
Grothe, Steven P., 4,631,532, Cl. 340-703.000.
Spibey, John: *See—*
Reinwall, Ernest W.; and Spibey, John, 4,630,984, Cl. 411-368.000.
Spicer, Barry; and Wills, Joseph T., to PipercrossLimited. Foam plastic air filter. 4,631,077, Cl. 55-487.000.
Spiesman, Robert L., to Honeywell Inc. Transceiver. 4,631,733, Cl. 375-7.000.
Spindler, Hans, to Trautz & Co. Inh. Hans Spindler. Discardable flashlight. 4,631,646, Cl. 362-118.000.
Spiral Systems, Inc.: *See—*
Campell, Jeptha E., 4,630,755, Cl. 222-56.000.
Spolyar, John L. Apparatus for gauging and determining spatial coordinates for a source of radiation to be employed in obtaining a radiograph of a patient. 4,630,375, Cl. 33-1.00B.
Spray-All, Inc.: *See—*
Chamberlin, Edward B.; Brown, Edward M.; and Towns, Edward J., 4,631,003, Cl. 417-151.000.
Springfix-Befestigungstechnik GmbH: *See—*
Ausprung, Erich, 4,630,957, Cl. 403-76.000.
Spurrier, Francis R.; Pierce, Bill L.; and Wright, Maynard K., to Westinghouse Electric Corp. Fuel cell plates with improved arrangement of process channels for enhanced pressure drop across the plates. 4,631,239, Cl. 429-39.000.
Square D Company: *See—*
Dvorak, Robert F.; Jansen, Harley W.; and Zylstra, Henry J., 4,631,624, Cl. 361-89.000.
Stadden, Cecine B. Tile game. 4,630,831, Cl. 273-292.000.
Stadler, Peter: *See—*
Lockhoff, Oswald; Kruger, Bernd-Wieland; Stadler, Peter; Metzger, Karl G.; Kroll, Hein-Peter; Schaller, Klaus; and Zeiler, Hans-Joachim, 4,631,272, Cl. 514-23.000.
Stahl, Dieter: *See—*
Disselbeck, Dieter; and Stahl, Dieter, 4,631,221, Cl. 428-166.000.
Stahl, Philip; Wilcock, Donald F.; and Fuller, Dudley D., to Ferrofluidics Corporation. Ferrofluid bearing and seal apparatus. 4,630,943, Cl. 384-133.000.
Standard Elektrik Lorenz AG: *See—*
Forker, Dieter; Hassler, Joachim; Lau, Bernhard; and Schmidt, Rolf, 4,630,909, Cl. 354-1.000.
Standard Oil Company (Indiana): *See—*
Hagen, Gary P., 4,631,264, Cl. 502-243.000.
Standard Products Company, The: *See—*
Jackson, Norman C., 4,631,104, Cl. 156-293.000.
Standard Telephones and Cables Public Limited Company: *See—*
Taylor, Frank; and Burton, Trevor, 4,630,358, Cl. 29-594.000.
Standex electronics (UK) Limited: *See—*
Hill, John; Turczanski, Henryk; and Coote, Cyril E., 4,630,359, Cl. 29-602.00R.
Stanley Electric Co., Ltd.: *See—*
Teshima, Tohru; Naete, Hidehiko; and Robert, Pierre H., 4,631,513, Cl. 340-52.00R.
Stark, Gustav: *See—*
Poersch, Hans; and Stark, Gustav, 4,630,987, Cl. 414-32.000.
Stauffer Chemical Company: *See—*
Baker, Roy A.; Costello, Rocky C.; and Engel, Michael J., 4,631,068, Cl. 23-293.00S.
Staurseth, Robert A. Retractable utility saw. 4,630,373, Cl. 30-514.000.
Staviski, Theodore. Electrical component lead bending and cutting apparatus. 4,630,354, Cl. 29-566.400.
STC plc: *See—*
Tomlinson, Paul G.; and Newbould, Richard T., 4,631,078, Cl. 65-3.110.
Steck, Werner; and Jakusch, Helmut, to BASF Aktiengesellschaft. Ferrimagnetic particles and their preparation. 4,631,140, Cl. 252-62.560.
Steen, Grant F.: *See—*
Romania, Samuel R.; and Steen, Grant F., 4,631,637, Cl. 361-413.000.
Steer, John E., to Allied Corporation. Reservoir for a master cylinder. 4,630,443, Cl. 60-535.000.
Steeves, Jay M.; and Cotta, Gilbert A., to Senco Products, Inc. Fastener driving apparatus and methods and fastener supply. 4,630,766, Cl. 227-8.000.
Steiner, Carl. System for introducing by reflection additional information into binoculars. 4,630,900, Cl. 350-539.000.
Steinkamp, Norman A.: *See—*
Sonnentag, Kurt J.; and Steinkamp, Norman A., 4,630,532, Cl. 99-279.000.
Stelzer, Josef, to Semperit Reifen AG. Pneumatic vehicle tire tread, especially radial-ply tire for trucks. 4,630,661, Cl. 152-209.00R.
Stendel, Wilhelm; and Voege, Herbert, to Bayer Aktiengesellschaft. Pyrethroid-containing molded articles for combating ectoparasites. 4,631,231, Cl. 428-413.000.
Stenner, Gustav H., to G. H. Stenner & Co., Inc. Peristaltic pump housing. 4,631,008, Cl. 417-477.000.
Stenzel, Wolfgang; and Hofferber, Eva, to Beiersdorf Aktiengesellschaft. Substituted phenylpiperazinyl-propanols, a process for their preparation and their use, and formulations containing these compounds. 4,631,281, Cl. 514-252.000.
Stettner & Co.: *See—*
Tiepke, Gunter, 4,631,391, Cl. 219-541.000.
Steurmer, Karl H., to Planet Products, Corporation. Apparatus for arranging articles in a predetermined manner and method of making same. 4,630,725, Cl. 198-425.000.
Stevens, Alec M. Extendible boom including a rack and pinion mechanism. 4,630,741, Cl. 212-203.000.
Stevens, Robert B. Micro-stroke mechanical toothbrush. 4,630,326, Cl. 15-22.00R.
Stewart, Douglas V.; Tabereaux, Alton T.; and Willett, John T., to Reynolds Metals Company. Alumina reduction cell. 4,631,121, Cl. 204-243.00R.
Stickler, David B.: *See—*
Westra, Leonard F.; Woodroffe, Jaime A.; and Stickler, David B., 4,631,080, Cl. 65-134.000.
Stieber, Joseph F., to Uniroyal Chemical Company, Inc. Curable rubber compositions comprising substituted dithiocarbamylurea accelerators. 4,631,316, Cl. 525-352.000.
Stjarne, Olov G.; Severinsson, Lars M.; and Lowrie, Alastair C. B., to Sab Nife AB. Block brake actuator for a rail vehicle. 4,630,714, Cl. 188-206.00R.
Stockhausen, Dolf; Nowak, Rudolf; Chmelir, Miroslav; Kaussen, Manfred; and Dahmen, Kurt, to Chemische Fabrik Stockhausen GmbH. Process for finish dressing minerally dressed leathers or those dressed by a combined method, using polymer dressings. 4,631,063, Cl. 8-94.210.
Stockton, Edward. Carrier for sheet material, wall paneling or the like. 4,630,838, Cl. 280-47.170.
Stokes, Vijay K., to General Electric Company. Plastic end shield with thermal barrier for dynamoelectric machines. 4,631,433, Cl. 310-89.000.
Stolen, Rogers H.: *See—*
Ashkin, Arthur; and Stolen, Rogers H., 4,630,890, Cl. 350-96.300.
Stoping Aktiengesellschaft: *See—*
Waltenspuhl, Rolf, 4,630,668, Cl. 164-437.000.
Storey, Patricia J. Knitting project workbox. 4,630,730, Cl. 206-392.000.
Stoy, Vladimir A.; and Chvapil, Milos, to S.K.Y. Polymers, Ltd. (Kingston Technologies). Injectable physiologically-acceptable polymeric composition. 4,631,188, Cl. 424-81.000.
Strasser, Joseph P.: *See—*
Kozuma, Jiro; Hamaguchi, Hirohiko; Shibahara, Tetsuya; and Strasser, Joseph P., 4,631,301, Cl. 523-122.000.
Strassner, Keith D.: *See—*
Johns, Marshall E.; Strassner, Keith D.; and Braga, Thomas G., 4,631,138, Cl. 252-8.555.
Stratford, Ian J.: *See—*
Ahmed, Israr; Adams, Gerald E.; Stratford, Ian J.; and Gibson, David, 4,631,289, Cl. 514-397.000.
Straubel, Max: *See—*
Hofer, Gerald; Hofmann, Eberhard; Laufer, Helmut; Rossignol, Francois; Schwartz, Reinhard; Straubel, Max; and Tissot, Raymond, 4,630,587, Cl. 123-502.000.
Kuttner, Thomas; Straubel, Max; and Wessel, Wolf, 4,630,582, Cl. 123-339.000.
Strickman, Melvyn B.; and Fournier, Erick-Pierre. Disposable contraceptive cervical barrier. 4,630,602, Cl. 128-127.000.
Stringer, R. G.: *See—*
Stringer, Richard G., 4,630,762, Cl. 223-66.000.
Stringer, Richard G., to Stringer, R. G.; and Michell, Andre Clive. Mannequin. 4,630,762, Cl. 223-66.000.

Sturtz, Georges, to Societe Nationale Elf Aquitaine (Production). Diphosphonic extractants. 4,631,142, Cl. 252-184.000.

Stutler, Richard A.; and Harris, Jeffrey T., to United States of America, Navy. Scanning alarm electronic processor. 4,631,662, Cl. 364-200.000.

Stutznacker, Klaus, to Nahmaschinenfabrik Emil Stutznacker GmbH & Co. KG. Device for stabilizing the needle thread loop in sewing machines. 4,630,560, Cl. 112-302.000.

Su, Taian: *See*—
Rathbun, Donald J.; Tarbox, Bruce H.; and Su, Taian, 4,631,723, Cl. 371-10.000.

Suarez, Jose I.: *See*—
Borras, Jaime A.; and Suarez, Jose I., 4,631,496, Cl. 331-1.00A.

Subtex, Inc.: *See*—
George, Stephen; and George, Thomas, 4,631,224, Cl. 428-246.000.

Sudol, George A.; Comfort, Edward H.; and Solomon, Stephen R., to Burroughs Corporation. Disk drive disk control apparatus. 4,631,608, Cl. 360-99.000.

Suerth, John E.: *See*—
McGee, Theodore W.; Muncy, Charles; and Suerth, John E., 4,631,210, Cl. 428-13.000.

Sugaya, Toshihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. System for detecting the position of a read-write head on a disk recording medium having servo sectors with three or more servo patterns. 4,631,606, Cl. 360-78.000.

Suginaka, Shunji: *See*—
Komamura, Tawara; Suginaka, Shunji; and Tachibana, Kimie, 4,631,251, Cl. 430-548.000.

Sugiyama, Suguru: *See*—
Tomimasu, Takio; Noguchi, Tsutomu; Tanino, Hiroshi; and Sugiyama, Suguru, 4,631,743, Cl. 378-138.000.

Sugiyama, Toru: *See*—
Watanabe, Kainen; Yasuhara, Hiroto; Sugiyama, Toru; Shimizu, Keiji; and Murata, Yoshihiro, 4,630,772, Cl. 238-159.000.

Sulesky, Donald J.: *See*—
Czumak, Frank M.; and Sulesky, Donald J., 4,630,914, Cl. 354-212.000.

Suling, Carlhans: *See*—
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Uytterhoeven, Herman; de Winter, Walter; Hoffarth, Gunther; and Richter, Wolfgang, 4,631,243, Cl. 430-114.000.

Sullivan, Clarence W.: *See*—
True, Martin E.; and Sullivan, Clarence W., 4,630,688, Cl. 173-163.000.

Sulzer Brothers Limited: *See*—
Bosshard, Ernst, 4,630,738, Cl. 211-60.100.

Sumi, Hidezi: *See*—
Kokado, Masayuki; and Sumi, Hidezi, 4,631,567, Cl. 357-38.000.

Sumi, Toshio: *See*—
Akesaka, Toshio; Suzuki, Kenju; and Sumi, Toshio, 4,630,869, Cl. 299-33.000.

Sumida, Nobuyuki: *See*—
Arii, Kazuhiro; Yamamoto, Yasuo; Sumida, Nobuyuki; Hanaoka, Katsumi; and Tanaka, Kazuhiro, 4,631,509, Cl. 336-92.000.

Sumitomo Chemical Company, Limited: *See*—
Kayane, Yutaka; Omura, Takashi; Otake, Katsumasa; and Takeshita, Akira, 4,631,341, Cl. 544-189.000.
Yamamoto, Haruyasu; Kasamatsu, Kiyoshi; Okabe, Takayuki; and Mukai, Kunio, 4,631,347, Cl. 260-963.000.

Sumitomo Electric Industries, Ltd.: *See*—
Nishimura, Akira, 4,631,225, Cl. 428-250.000.

Sumitomo Metal Industries, Ltd.: *See*—
Fukui, Kunihiro; Nishihara, Minoru; Mase, Toshiro; Morita, Yoshiyasu; and Kawashima, Hisakazu, 4,630,849, Cl. 285-55.000.

Sun Hydraulics Corp.: *See*—
DiBartolo, Ernest A., 4,630,640, Cl. 137-501.000.

Sunagawa, Hiroshi: *See*—
Kawajiri, Kazuhiro; Sunagawa, Hiroshi; Nozaki, Nobuharu; Hosoi, Yuichi; and Takahashi, Kenji, 4,631,407, Cl. 250-327.200.

Sunago, Hirofumi: *See*—
Matsumoto, Mitsuaki; Furuyama, Masatosi; Tomioka, Tadao; Sunago, Hirofumi; and Higuchi, Masakazu, 4,631,181, Cl. 423-449.000.

Sunbeam Plastics Corporation: *See*—
Wright, David M., 4,630,743, Cl. 215-216.000.

Sundstrand Corporation: *See*—
Burandt, Wesley A., 4,631,000, Cl. 417-225.000.
Cygnor, John E.; and Hallman, John, 4,631,009, Cl. 418-15.000.
Sutrina, Thomas A., 4,631,573, Cl. 357-82.000.

Sundvall, Nils J.: *See*—
Johansson, Jan H.; and Sundvall, Nils J., 4,631,359, Cl. 379-324.000.
Johansson, Jan H.; and Sundvall, Nils J., 4,631,360, Cl. 379-324.000.

Sung, Rodney L., to Texaco Inc. Anti-wear additives for alcohol fuels. 4,631,069, Cl. 44-56.000.

Sunnen Products Company: *See*—
Schneider, Michael H.; and Chadwell, Thomas J., 4,630,377, Cl. 33-181.0AT.

Suomen Sokeri Oy: *See*—
Heikkila, Heikki, 4,631,129, Cl. 210-635.000.

Supcoe, Robert F.; and Radakovich, Thomas, to United States of America, Army. Underwater biocidal wax composition and preparation thereof. 4,631,302, Cl. 523-122.000.

Supcoe, Robert F.; Singerman, Harold H.; and Whitacre, Jack E., to United States of America, Navy. Underwater formulation and method for cleaning and waxing simultaneously. 4,631,303, Cl. 523-177.000.

Suri, Alajos: *See*—
Harsanyi, Jozsef; Pinter, Janos; and Suri, Alajos, 4,630,931, Cl. 366-107.000.

Sutrina, Thomas A., to Sundstrand Corporation. Cooled stack of electrically isolated semiconductors. 4,631,573, Cl. 357-82.000.

Suuchi, Osamu; Mimaya, Shuzo; and Ohashi, Masaru, to Nippon Mining Co., Ltd. Method for discharging consolidated waste catalyst. 4,630,779, Cl. 241-1.000.

Suzuki, Hideo: *See*—
Hase, Takashi; Yoshida, Hidemi; Suzuki, Hideo; and Hayakawa, Morio, 4,631,445, Cl. 313-467.000.

Suzuki, Kazuhiro, to Nippon Cable System Inc. Transmission operating device. 4,630,500, Cl. 74-473.00R.

Suzuki, Kenju: *See*—
Akesaka, Toshio; Suzuki, Kenju; and Sumi, Toshio, 4,630,869, Cl. 299-33.000.

Suzuki, Mikio; and Yamazaki, Masafumi, to Nissan Motor Company, Limited. Spark ignition timing control system for an internal combustion engine with retarding means responsive to transmission gear shifting. 4,630,583, Cl. 123-425.000.

Suzuki, Minoru: *See*—
Horie, Motonobu; Suzuki, Minoru; and Ogura, Shinji, 4,630,724, Cl. 198-399.000.

Suzuki Motor Co., Ltd.: *See*—
Sawaki, Yasushi; Iguchi, Hironori; and Shimizu, Tateshi, 4,630,580, Cl. 123-196.00R.

Suzuki, Toshio, to Toray Silicone Co., Ltd. Alkenyl organopolysiloxane and curable composition therefrom. 4,631,321, Cl. 525-478.000.

Suzzi, Robert J.: *See*—
Leman, Jean-Luc; Russier, Michel V.; and Suzzi, Robert J., 4,630,998, Cl. 416-134.00A.

Svensson, Lars. Post for traffic signs, lighting and the like. 4,630,413, Cl. 52-98.000.

Swanson, Dale A. Projectile sensing target. 4,630,832, Cl. 273-374.000.

Swart, Kyle D.: *See*—
Landoll, Donald R.; Swart, Kyle D.; and Morris, Joseph B., 4,630,991, Cl. 414-478.000.

Sweet, Edmund G. F., to Ontario Research Foundation. Viscometer. 4,630,468, Cl. 73-59.000.

Sweet, Richard F. Playing card holder. 4,630,824, Cl. 273-150.000.

Swim, Steven M. Record album labeling tab. 4,630,385, Cl. 40-340.000.

Swiss Aluminium Ltd.: *See*—
Roczyn, Hans-Gerd, 4,631,236, Cl. 428-558.000.

Sword, Anthony J.: *See*—
Hill, John W.; and Sword, Anthony J., 4,631,657, Cl. 364-167.000.

Sylvester, Robert D., Jr.; Horn, Paul C.; and Bober, Vincent J., to GFS Manufacturing Company, Inc. Toroid transformers and secondary windings. 4,631,511, Cl. 336-180.000.

Synergetics, Inc.: *See*—
Howard, Thomas C., 4,630,892, Cl. 350-264.000.

Szentivanyi, Zsolt: *See*—
Thormer, Joachim; Leibbrandt, Friedrich; Szentivanyi, Zsolt; and Buding, Hartmuth, 4,631,309, Cl. 524-426.000.

Szymanski, Richard: *See*—
Lapins, Daniel W.; and Szymanski, Richard, 4,630,416, Cl. 52-239.000.

T.A.S., Inc.: *See*—
Sayler, William H.; and White, Justin C., 4,630,554, Cl. 110-264.000.

T.J. Gundlach Machine Company: *See*—
Brown, Donald W., Jr.; and Kohler, Mark L., 4,630,781, Cl. 241-159.000.

T&N Research Ltd.: *See*—
Baker, Ralph; Smith, Eric T.; Dickinson, Vaughan T.; McKenzie, Noel C.; and Hargreaves, Brian, 4,631,209, Cl. 427-392.000.

Tabereaux, Alton T.: *See*—
Stewart, Douglas V.; Tabereaux, Alton T.; and Willett, John T., 4,631,121, Cl. 204-243.00R.

Tachibana, Kimie: *See*—
Komamura, Tawara; Suginaka, Shunji; and Tachibana, Kimie, 4,631,251, Cl. 430-548.000.

Taft, Philip A.: *See*—
Reynolds, Desmond H. J.; and Taft, Philip A., 4,630,630, Cl. 137-68.100.

Taguchi, Yoshinori; and Yamanami, Tsuguya, to Wacom Co., Ltd. Coordinate input device with display. 4,631,356, Cl. 178-19.000.

Taheri, Syde A. Oxygenator. 4,631,053, Cl. 604-49.000.

Taishoff, Howard A. Method and apparatus for converting a conventional internal combustion engine into a high speed electric motor and generator. 4,631,455, Cl. 318-37.000.

Takabayashi, Fumiki: *See*—
Minemura, Norihiro; Takabayashi, Fumiki; and Yamada, Setsuo, 4,631,066, Cl. 8-115.560.

Takagi, Kazumasa: *See*—
Nagatsuma, Kazuyuki; Takagi, Kazumasa; and Matsumura, Hiroyoshi, 4,631,402, Cl. 250-231.00R.

Takagi, Yoshiaki: *See*—
Isobe, Susumu; Matsunaga, Kenkichi; Takagi, Yoshiaki; and Sato, Norikatsu, 4,631,169, Cl. 420-443.000.

Takahashi, Hiroto: *See*—
Ikeda, Masami; Shibata, Makoto; Matsuda, Hiroto; and Takahashi, Hiroto, 4,631,555, Cl. 346-140.00R.

Takahashi, Kenji: *See*—
Kawajiri, Kazuhiro; Sunagawa, Hiroshi; Nozaki, Nobuharu; Hosoi, Yuichi; and Takahashi, Kenji, 4,631,407, Cl. 250-327.200.

Takahashi, Yoshiaki, to Pioneer Electronic Corp. Audio output amplifying device. 4,631,490, Cl. 330-51.000.

Takamura, Moriyuki; Mukasa, Shigeru; and Ibi, Takashi, to Fujitsu Limited. Error correcting and detecting system. 4,631,725, Cl. 371-39.000.
Takato, Kenji; Ayano, Mitsutoshi; Shibuya, Kiyoshi; Iijima, Yoshimi; and Serikawa, Atsuo, to Fujitsu Limited. Battery feed circuit for subscriber line. 4,631,366, Cl. 340-333.000.
Takaya, Takao; Sakane, Kazuo; Yamanaka, Hideaki; and Miyai, Kenzi, to Fujisawa Pharmceutical Co., Ltd. Halovinyl cephem compounds. 4,631,274, Cl. 514-202.000.
Takayama, Toshio; and Haraikawa, Tetsuo, to Tokico Ltd. Vehicle braking system. 4,630,706, Cl. 180-273.000.
Takei, Toshihiro: *See—*
Imoto, Yuzo; Wakata, Hideo; Takei, Toshihiro; Hattori, Yoshiyuki; and Nomura, Yoshihisa, 4,630,871, Cl. 303-113.000.
Takeichi, Hitoshi: *See—*
Uchida, Rokuroh; Nagasaki, Katsuhiko; Miyake, Yasunori; Ohno, Michio; Takeichi, Hitoshi; and Matsumoto, Hiroji, 4,630,612, Cl. 128-660.000.
Takenaka, Hiroyuki: *See—*
Ohmori, Shunji; Takenaka, Hiroyuki; Hozoji, Akira; Kono, Kazunori; Yoshikawa, Kiyomitsu; and Kajihara, Seishi, 4,630,514, Cl. 83-342.000.
Takeshita, Akira: *See—*
Kayane, Yutaka; Omura, Takashi; Otake, Katsumasa; and Takeshita, Akira, 4,631,341, Cl. 544-189.000.
Takeuchi, Shigeru: *See—*
Imabayashi, Koji; Kawamura, Hiroshi; Takeuchi, Shigeru; Shinobu, Masayoshi; and Kawajiri, Shinobu, 4,631,594, Cl. 358-231.000.
Takeuchi, Yasuhito: *See—*
Yamaguchi, Keiki; Higashiizumi, Takao; Shimazaki, Toru; Sano, Shinichi; and Takeuchi, Yasuhito, 4,631,710, Cl. 367-103.000.
Takeuchi, Yoshinori: *See—*
Tanaka, Katsuyuki; Terashima, Seiichiroo; Takeuchi, Yoshinori; Odaka, Toshiko; and Saito, Yokuo, 4,630,926, Cl. 356-357.000.
Takino, Kiyoko; Asahi, Hidetoshi; and Wada, Hiroshi, to Eiken Kagaku Kabushiki Kaisha. Composition for assaying for nitrites. 4,631,255, Cl. 435-37.000.
Tal-Mor, Emile: *See—*
Zvi, Zadok; Kendi, Abraham; and Tal-Mor, Emile, 4,630,396, Cl. 49-55.000.
Tamba, Shinichi; Ogino, Toru; and Fukui, Noboru, to Kawasaki Jukogyo Kabushiki Kaisha. Throttle control device for general purpose engine. 4,631,153, Cl. 261-52.000.
Tamura, Hifumi; Shepherd, Clay; Ishitani, Toru; and Umemura, Kaoru, to Hitachi, Ltd. Ion source. 4,631,448, Cl. 315-111.810.
Tamura, Takahiko: *See—*
Hongu, Masayuki; Tamura, Takahiko; and Tokuhara, Masaharu, 4,631,589, Cl. 358-171.000.
Tanaka, Fujio; and Imamura, Nobutake, to Kokusai Denshin Denwa Kabushiki Kaisha. Magneto-optical recording medium. 4,631,617, Cl. 360-131.000.
Tanaka, Katsuyuki; Terashima, Seiichiroo; Takeuchi, Yoshinori; Odaka, Toshiko; and Saito, Yokuo, to Hitachi, Ltd. Fine clearance measuring apparatus. 4,630,926, Cl. 356-357.000.
Tanaka, Kazuhiro: *See—*
Arii, Kazuhiro; Yamamoto, Yasuo; Sumida, Nobuyuki; Hanaoka, Katsumi; and Tanaka, Kazuhiro, 4,631,509, Cl. 336-92.000.
Tanaka, Megumu: *See—*
Kano, Masafumi; Tanaka, Megumu; Sato, Atsushi; and Kawakami, Shigenobu, 4,631,632, Cl. 361-315.000.
Tanino, Hiroshi: *See—*
Tomimasu, Takio; Noguchi, Tsutomu; Tanino, Hiroshi; and Sugiyama, Suguru, 4,631,743, Cl. 378-138.000.
Tanner, John E.; and Mead, Carver A., to California Institute of Technology. Correlating optical motion detector. 4,631,400, Cl. 250-221.000.
Tans, Petrus P.; and Lashof, Daniel A., to United States of America, Energy. Fiberoptic spectrophotometer. 4,630,923, Cl. 356-301.000.
Tanuma, Jiro; Uchida, Takao; and Hayashi, Kunihal, to Oki Electric Industry Co., Ltd. Method of leading a moving body driven by a direct current brushless motor to a starting position. 4,631,457, Cl. 318-254.000.
Tarbox, Bruce H.: *See—*
Rathbun, Donald J.; Tarbox, Bruce H.; and Su, Taian, 4,631,723, Cl. 371-10.000.
Tardif, Arthur J., to Raytheon Company. Digital sound synthesizer. 4,631,747, Cl. 381-51.000.
Taube, John; O'Dell, Lawrence W.; and O'Dell, Michael D. Video-stereoscopic-image-producing system. 4,631,580, Cl. 358-88.000.
Tawada, Yoshihisa; and Tsuge, Kazunori, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Integrated solar cell. 4,631,351, Cl. 136-244.000.
Tayco Developments, Inc.: *See—*
Taylor, Paul H., 4,630,805, Cl. 267-64.130.
Taylor, Frank; and Burton, Trevor, to Standard Telephones and Cables Public Limited Company. Method of making an electrostatic transducer of the moving coil type. 4,630,358, Cl. 29-594.000.
Taylor, Henry F.; Sigel, George H.; and Gingerich, Michael E., to United States of America, Navy. Optical waveguide apparatus and method for manufacturing. 4,630,883, Cl. 350-96.150.
Taylor, John E., to BICC Public Limited Company. Optical fibre ribbon structure. 4,630,887, Cl. 350-96.230.
Taylor, Paul H., to Tayco Developments, Inc. Tension-compression liquid spring unit. 4,630,805, Cl. 267-64.130.
Taylor, Robert W. A. Bale handler. 4,630,986, Cl. 414-24.600.
Taylor, William. Pool entry and exit device. 4,630,709, Cl. 182-48.000.
TDK Corporation: *See—*
Hashizume, Kenji; Shiba, Haruo; and Okamura, Masatoshi, 4,631,619, Cl. 360-132.000.
te Beest, Hans: *See—*
Hellerhoff, Josef; Bunse, Peter; and te Beest, Hans, 4,630,349, Cl. 29-434.000.
Teichmann, Gunther: *See—*
Rademachers, Jakob; Naumann, Rolf; and Teichmann, Gunther, 4,631,089, Cl. 106-304.000.
Teijin Limited: *See—*
Minemura, Norihiro; Takabayashi, Fumiki; and Yamada, Setsuo, 4,631,066, Cl. 8-115.560.
Yoshimoto, Masato; and Ohwaki, Shinji, 4,631,162, Cl. 264-167.000.
Tektronix, Inc.: *See—*
Caspell, George J., 4,631,518, Cl. 340-347.0DA.
Teleco Oilfield Services Inc.: *See—*
Duckworth, Allen, 4,630,809, Cl. 267-141.100.
Telefonaktiebolaget LM Ericsson: *See—*
Hammarberg, Lars E., 4,631,475, Cl. 324-102.000.
Johansson, Jan H.; and Sundvall, Nils J., 4,631,359, Cl. 379-324.000.
Johansson, Jan H.; and Sundvall, Nils J., 4,631,360, Cl. 379-324.000.
Teng, Chuan C.: *See—*
Beasley, Thomas R.; and Teng, Chuan C., 4,630,690, Cl. 175-57.000.
Tenmyo, Ichiro: *See—*
Akita, Yoshisuke; Tenmyo, Ichiro; Hayashi, Kiyoshi; Kihara, Kazuyuki; and Mito, Akio, 4,630,639, Cl. 137-486.000.
Teramachi, Hiroshi. Linear slide bearing. 4,630,872, Cl. 384-45.000.
Terasawa, Koji, to Canon Kabushiki Kaisha. Ink jet printing apparatus with suction recovery unit. 4,631,554, Cl. 346-140.00R.
Terashima, Seiichiroo: *See—*
Tanaka, Katsuyuki; Terashima, Seiichiroo; Takeuchi, Yoshinori; Odaka, Toshiko; and Saito, Yokuo, 4,630,926, Cl. 356-357.000.
Terra Tek, Inc.: *See—*
Jones, Arfon H.; and Green, Sidney J., 4,630,868, Cl. 299-4.000.
Tersteegen, Johannes, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Electrohydraulic regulating drive. 4,630,523, Cl. 91-1.000.
Terumo Corporation: *See—*
Watanabe, Masaharu, 4,631,130, Cl. 210-651.000.
Teshima, Tohru; Naete, Hidehiko; and Robert, Pierre H., to Regie Nationale des Usines Renault; and Stanley Electric Co., Ltd. Display unit of speedometer for automobile. 4,631,513, Cl. 340-52.00R.
Testa, Anthony M.: *See—*
Brooke, Robert L.; McConnell, Peter J.; Testa, Anthony M.; and Maksymonko, George B., 4,630,470, Cl. 73-146.200.
Tetra Pak Developpement SA: *See—*
Cheever, Richard N., 4,631,444, Cl. 313-420.000.
Texaco Inc.: *See—*
Burton, James R.; and Kushner, David J., 4,631,139, Cl. 252-49.300.
Sung, Rodney L., 4,631,069, Cl. 44-56.000.
Texas Instruments: *See—*
Inoue, Shinji; and Akundi, Rama S., 4,631,421, Cl. 307-297.000.
Texas Instruments Incorporated: *See—*
Breedlove, Paul S.; Moore, James H.; Brantingham, George L.; and Wiggins, Richard H., Jr., 4,631,748, Cl. 381-51.000.
Hayn, John, II; and Schabowski, John, 4,631,659, Cl. 364-200.000.
Larrabee, Graydon B., 4,631,234, Cl. 428-428.000.
Thaler, Michael R., to Image Communications, Inc. Linear motor facsimile machine. 4,631,432, Cl. 310-14.000.
Theofanous, Theos E. Valve seat resurfacing apparatus. 4,630,977, Cl. 408-83.500.
Thermo Electron-Web Systems, Inc.: *See—*
Croteau, Donald W., 4,630,328, Cl. 15-257.00R.
Thermo-Serv, Inc.: *See—*
Trombly, Edgar F., 4,630,744, Cl. 220-1.00R.
Thermocell, Ltd.: *See—*
Colson, Wendell B., 4,631,108, Cl. 156-461.000.
Theurer, Josef; and Hansmann, Johann, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile track leveling, lining and tamping machine. 4,630,541, Cl. 104-7.200.
Thioux, Alain: *See—*
Carre, Jean-Jacques; Thioux, Alain; and Mery, Jean-Claude, 4,630,713, Cl. 188-73.440.
Thoma, Klemens: *See—*
Volker, Wolfgang; and Thoma, Klemens, 4,630,873, Cl. 312-209.000.
Thomann, Roland; Witschi, Heinz; Brink, Heinz-Deiter; and Amann, Markus. Drainage channel with locking grate. 4,630,962, Cl. 404-2.000.
Thomas, Charles E.; Lee, Minyoung; Bedard, James F.; Hayashi, Steven R.; and Yerazunis, William S., to General Electric Company. Acoustic detection of contact between cutting tool and workpiece. 4,631,683, Cl. 364-474.000.
Thomas, Johnny M., II: *See—*
Mommer, Richard P.; and Thomas, Johnny M., II, 4,631,192, Cl. 426-69.000.
Thomas, Richard D.: *See—*
Zimmerman, Karen A.; Weston, Randall L.; and Thomas, Richard D., 4,630,472, Cl. 73-161.000.
Thompson, David A.: *See—*
Chainer, Timothy J.; Scranton, Robert A.; and Thompson, David A., 4,630,941, Cl. 384-1.000.
Thompson, George J. Semi-adjustable service platform apparatus for gantry crane. 4,630,708, Cl. 182-12.000.

Thompson, Warren L.: *See*—
Burk, Ronnie F.; Delfs, Larry M.; Gilmore, Michael R.; and Thompson, Warren L., 4,630,526, Cl. 91-452.000.
Thomson CSF: *See*—
Birard, Lucien, 4,631,639, Cl. 361-417.000.
Magarshack, John; and Pavlidis, Dimitri, 4,631,492, Cl. 330-277.000.
Romeas, Rene ; Bricot, Claude; and Gerard, Jean-Louis, 4,631,713, Cl. 369-54.000.
Thomson, David G., to Waltec Inc. Pipe repair clamp. 4,630,647, Cl. 138-99.000.
Thomson, Lorenzo H., to Little Rapids Corp. Container with pouring spout and removable cover. 4,630,761, Cl. 222-551.000.
Thormer, Joachim; Leibbrandt, Friedrich; Szentivanyi, Zsolt; and Buding, Hartmuth, to Bayer Aktiengesellschaft. Shaped articles for use in the exploration for and/or production of petroleum and natural gas. 4,631,309, Cl. 524-426.000.
Thormer, Joachim: *See*—
Buding, Hartmuth; Fiedler, Paul; Konigshofen, Heinrich; and Thormer, Joachim, 4,631,315, Cl. 525-338.000.
THORN EMI Domestic Appliances Limited: *See*—
Crossley, Peter W.; Fellerman, Bernard F.; and Goodchild, Graham H., 4,631,390, Cl. 219-449.000.
Thorn, Lawrence B.; and Betts, Robert E., to United States of America, Army. Device for flash suppression of a rocket motor. 4,630,539, Cl. 102-202.000.
TI Domestic Appliances Limited: *See*—
Manning, Howard J., 4,631,388, Cl. 219-326.000.
Tichy, Thomas H., to Motorola, Inc. Method of mounting a piezoelectric helmholtz transducer on a printed circuit board. 4,630,342, Cl. 29-25.350.
Tideland Signal Corporation: *See*—
Ploussios, George, 4,631,544, Cl. 343-771.000.
Tiepke, Gunter, to Stettner & Co. Electrical heating device, especially for mirrors. 4,631,391, Cl. 219-541.000.
Tihanyi, Jeno , to Siemens Aktiengesellschaft. MISFET with input amplifier. 4,631,565, Cl. 357-23.400.
Tijs, Hendricus C. P., to Weld-Equip b.v. Pneumatically operating device comprising means for limiting the displacement of a piston. 4,630,529, Cl. 92-13.000.
Ting, Raymond M. L. Cellular steel decking. 4,630,414, Cl. 52-220.000.
Tippins, George W.: *See*—
Ginzburg, Vladimir B.; and Tippins, George W., 4,630,352, Cl. 29-527.700.
Tippins Machinery Company, Inc.: *See*—
Ginzburg, Vladimir B.; and Tippins, George W., 4,630,352, Cl. 29-527.700.
Tise, Frank P., to Hercules Incorporated. Acetylene compounds as shelf life improvers for photoresist compositions containing organic iodides. 4,631,247, Cl. 430-281.000.
Tissot, Raymond: *See*—
Hofer, Gerald; Hofmann, Eberhard; Laufer, Helmut; Rossignol, Francois; Schwartz, Reinhard; Straubel, Max; and Tissot, Raymond, 4,630,587, Cl. 123-502.000.
Titus, Hans-Joachim, to Krauss-Maffei Aktiengesellschaft. Method and apparatus for pneumatically evacuating centrifuges. 4,631,048, Cl. 494-13.000.
Tobia, Alfonso J.: *See*—
Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,631,283, Cl. 514-259.000.
Toei Denki Kabushiki Kaisha: *See*—
Ono, Tadahiro; and Igarashi, Shigenori, 4,631,523, Cl. 340-347.05Y.
Toida, Shouji: *See*—
Miyaji, Kenichi; Toida, Shouji; Ito, Seiichi; Watanabe, Isao; and Kishida, Masatoshi, 4,630,742, Cl. 215-13.00R.
Tokico Ltd.: *See*—
Komukai, Shigemi, 4,630,754, Cl. 222-28.000.
Takayama, Toshio; and Harakawa, Tetsuo, 4,630,706, Cl. 180-273.000.
Tokisue, Hiromitsu: *See*—
Tsunaki, Nobuo; Tokisue, Hiromitsu; and Inoue, Hiroshi, 4,630,942, Cl. 384-8.000.
Tokoro, Setsuo; Shigematsu, Takashi; and Watanabe, Tomoyuki, to Toyota Jidosha Kabushiki Kaisha. Hydraulic control apparatus for a continuously variable transmission. 4,631,043, Cl. 474-18.000.
Tokuhara, Masaharu: *See*—
Honga, Masayuki; Tamura, Takahiko; and Tokuhara, Masaharu, 4,631,589, Cl. 358-171.000.
Tokuyama, Keiichi: *See*—
Masuda, Mitsuhiro; Igarashi, Osamu; and Tokuyama, Keiichi, 4,630,840, Cl. 280-707.000.
Tokuyama Sekisui Industry Corporation, Limited: *See*—
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,631,717, Cl. 369-276.000.
Tokyo Electric Co., Ltd.: *See*—
Kitagawa, Tohru; Sakamoto, Koichiro; and Ushijima, Yasuhiro, 4,630,491, Cl. 73-862.670.
Tokyo Juki Industrial Co., Ltd.: *See*—
Kinoshita, Tomoaki, 4,630,559, Cl. 112-291.000.
Nii, Tomio, 4,630,951, Cl. 400-697.100.
Tokyo Keiki Co., Ltd.: *See*—
Akita, Yoshisuke; Tenmyo, Ichiro; Hayashi, Kiyoshi; Kihara, Kazuyuki; and Mito, Akio, 4,630,639, Cl. 137-486.000.
Tokyo Roki Co., Ltd.: *See*—
Kurihara, Mitsuo; Sato, Fumio; Iwanawa, Yoshiyuki; Koibuchi, Nobutaka; and Harada, Hiroshi, 4,631,076, Cl. 55-283.000.
Tokyo Sanyo Electric Co., Ltd: *See*—
Kishimoto, Daisaburo, 4,630,451, Cl. 62-247.000.
Tokyo Shibaura Denki Kabushiki Denki: *See*—
Ando, Hideo, 4,631,395, Cl. 250-201.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Arimura, Yoshiaki; Obana, Masao; and Hitomi, Yutaka, 4,631,689, Cl. 364-513.000.
Iizuka, Tetsuya, 4,631,563, Cl. 357-23.100.
Sadamatsu, Hiroshi; Wada, Yoshio; and Ito, Hideaki, 4,631,419, Cl. 307-255.000.
Sakamoto, Tsutomu, 4,631,672, Cl. 364-200.000.
Sakamoto, Tsutomu, 4,631,696, Cl. 364-748.000.
Sakamoto, Tsutomu, 4,631,703, Cl. 364-900.000.
Sugaya, Toshihiro, 4,631,606, Cl. 360-78.000.
Toll, Ian C., to Futaire Limited. Aircraft seats. 4,630,864, Cl. 297-232.000.
Tom McGuane Industries, Inc.: *See*—
Detweiler, Charles A., 4,630,642, Cl. 137-506.000.
Tomalia, Donald A.; and Dewald, James R., to Dow Chemical Company, The. Hydrolytically-stable dense star polyamine. 4,631,337, Cl. 528-391.000.
Tomashek, James R.: *See*—
Ward, Donald H.; and Tomashek, James R., 4,631,536, Cl. 340-857.000.
Tominaga, Takio; Noguchi, Tsutomu; Tanino, Hiroshi; and Sugiyama, Sugura, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. X-ray generating apparatus. 4,631,743, Cl. 378-138.000.
Tomioka, Tadao: *See*—
Matsumoto, Mitsuaki; Furuyama, Masatosi; Tomioka, Tadao; Sonago, Hirofumi; and Higuchi, Masakara, 4,631,181, Cl. 423-449.000.
Tomiyama, Akira: *See*—
Tomiyama, Tsuyoshi; and Tomiyama, Akira, 4,631,292, Cl. 514-452.000.
Tomiyama, Tsuyoshi; and Tomiyama, Akira, to Kotobuki Seiyaku Co., Ltd. 1,3-dioxane derivatives, method of their synthesis and anti-peptic ulcer agent. 4,631,292, Cl. 514-452.000.
Tomlinson, Paul G.; and Newbould, Richard T., to STC plc. Coating optical fibres. 4,631,078, Cl. 65-3.110.
Tomy Kogyo Co., Inc.: *See*—
Shiraishi, Masami, 4,631,040, Cl. 446-95.000.
Tong, Kun-Yuan. Expandable carrying case. 4,630,717, Cl. 190-104.000.
Toray Silicone Co., Ltd.: *See*—
Suzuki, Toshio, 4,631,321, Cl. 525-478.000.
Turelli, Guido; and Daniele, Vincenzo, to SGS-ATES Componenti Elettronici S.p.A. Synchronous demodulator for amplitude modulated signals. 4,631,485, Cl. 329-50.000.
Toromian, Kevork A.; Markovitz, Mark; and Cox, Frederick E., to General Electric Company. Unique epoxy resin compositions and composite molded bodies filled therewith. 4,631,230, Cl. 428-412.000.
Toshiba Kikai Kabushiki Kaisha: *See*—
Ono, Tadahiro; and Igarashi, Shigenori, 4,631,523, Cl. 340-347.05Y.
Tottrup, Peter B.; and Rostrup-Nielsen, Jens R., to Haldor Topsoe A/S. Process for preparation of a reducing gas. 4,631,182, Cl. 423-652.000.
Toumani, Rouben: *See*—
Arntsen, Tom D.; Embree, Milton L.; Havens, Joseph H.; and Toumani, Rouben, 4,631,362, Cl. 379-384.000.
Town, Michael-Harold: *See*—
Vorbruggen, Helmut; Elger, Walter; Town, Michael-Harold; and Schillinger, Ekkehard, 4,631,276, Cl. 514-211.000.
Towns, Edward J.: *See*—
Chamberlin, Edward B.; Brown, Edward M.; and Towns, Edward J., 4,631,003, Cl. 417-151.000.
Toyoda Gosei Co., Ltd.: *See*—
Mabuchi, Akira; Yano, Kenji; and Mizuno, Hisashi, 4,631,206, Cl. 427-340.000.
Toyomura, Shigeru, to Canon Kabushiki Kaisha. Power supply control device. 4,631,418, Cl. 307-200.00A.
Toyonaga, Yoshikazu: *See*—
Yoshimura, Syuichi; Kobayashi, Hiromu; Toyonaga, Yoshikazu; Yamazaki, Hozo; and Karatsu, Masanori, 4,631,180, Cl. 423-450.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Shibata, Norio, 4,630,581, Cl. 123-325.000.
Tokoro, Setsuo; Shigematsu, Takashi; and Watanabe, Tomoyuki, 4,631,043, Cl. 474-18.000.
Tracer Technologies, Inc.: *See*—
Walsh, Fraser M., 4,631,240, Cl. 429-105.000.
Traina, John. Method and apparatus for ultrasonic measurements of a medium. 4,630,482, Cl. 73-597.000.
Tran Kiem, Nguyen, to U.S. Philips Corporation. Transistor modulator for converting video game signals into antenna input signals for a television receiver. 4,631,502, Cl. 332-16.00T.
Tran, Van N., to Durac Limited. System for the microwave treatment of materials. 4,631,380, Cl. 219-10.55A.
Trans-Dyne, Incorporated: *See*—
Adler, Frank P., 4,630,715, Cl. 188-210.000.
Trautz & Co. Inh. Hans Spindler: *See*—
Spindler, Hans, 4,631,646, Cl. 362-118.000.
Travel-Aire, Inc.: *See*—
Eckstrom, William R.; and Conrad, John R., 4,630,530, Cl. 98-2.110.

TRE Corporation: *See*—
Etemovich, Alex, 4,631,093, Cl. 148-6.100.
Tremblay, Daniel. Audio-visual tunnel with endless conveyor. 4,630,908, Cl. 353-94.000.
Tretinyak, Carl W., to Berkley and Company, Inc. Bone marrow needle. 4,630,616, Cl. 128-753.000.
Trevino, Jose L.; and van Rooden, Bernardus J., to Dow Chemical Company, The. Polymeric compositions useful as binders in coating colors and coating colors prepared therefrom. 4,631,312, Cl. 525-221.000.
Triangle Package Machinery Co.: *See*—
Connors, Robert H.; and Williams, James T., 4,630,695, Cl. 177-1.000.
Trion Corporation: *See*—
Aoki, Akio, 4,630,318, Cl. 2-19.000.
Triplett, James T.: *See*—
Pithouse, Kenneth B.; Kridl, Thomas A.; and Triplett, James T., 4,631,098, Cl. 156-86.000.
Trocino, Joseph L. Detonator apparatus for liquid explosive compositions. 4,630,540, Cl. 102-307.000.
Trol-Mation, Inc.: *See*—
Mazzaro, Peter C.; and Legawiec, Ronald F., 4,630,442, Cl. 60-415.000.
Trombly, Edgar F., to Thermo-Serv, Inc. Container with registration rib. 4,630,744, Cl. 220-1.00R.
Troy, Seymour L.; and Mullenix, Kenneth E. Two-step bank draft. 4,630,844, Cl. 283-67.000.
Trube, Hans: *See*—
Schmidt, Manfred; Trube, Hans; and Grimm, Hermann, 4,630,327, Cl. 15-250.210.
True, Martin E.; and Sullivan, Clarence W., to Weatherford/Lamb, Inc. Power spinner for rotating a kelly joint. 4,630,688, Cl. 173-163.000.
Trutna, William R., Jr., to Hewlett-Packard Company. Wafer/mask alignment system using diffraction gratings. 4,631,416, Cl. 250-548.000.
Trutzschler GmbH & Co. KG: *See*—
Schopwinkel, Theo; and Weber, Wilfried, 4,630,336, Cl. 19-288.000.
TRW Inc.: *See*—
Gardner, Neal F., 4,631,568, Cl. 357-49.000.
Goodwin, Frank E.; Law, Hsiang-Yi D.; Morrison, Charles B.; and Figueroa, Luis, 4,631,729, Cl. 372-44.000.
Zimmerman, Thomas A., 4,631,572, Cl. 357-74.000.
Tsau, Josef H.: *See*—
Collopoulos, John A.; Young, James G.; and Tsau, Josef H., 4,631,195, Cl. 426-548.000.
Tsuboi, Masaharu; and Watanabe, Kuniaki, to Honda Giken Kogyo Kabushiki Kaisha. Device for driving electrical current generator for use in motorcycle. 4,631,469, Cl. 322-42.000.
Tsubokura, Fusao, to NEC Corporation. Semiconductor device for use in a large scale integration circuit. 4,631,571, Cl. 357-68.000.
Tsuchida, Nobuo: *See*—
Uchida, Tetsuei; Uchida, Tsutomu; Tsuchida, Nobuo; and Kazama, Susumu, 4,631,152, Cl. 261-4.000.
Tsuchiya, Haruhiko: *See*—
Ono, Tatsuhiro; Koike, Shin'ichi; Tsuchiya, Haruhiko; and Inoue, Yuji, 4,631,721, Cl. 370-85.000.
Tsuchiya, Kanji; and Ono, Shizumi, to Seikensha Co., Ltd. Apparatus for inactivation of enzymes in oil seeds. 4,630,534, Cl. 99-483.000.
Tsuge, Kazunori: *See*—
Tawada, Yoshihisa; and Tsuge, Kazunori, 4,631,351, Cl. 136-244.000.
Tsunaki, Nobuo; Tokitsue, Hironitsu; and Inoue, Hiroshi, to Hitachi, Ltd. Guiding apparatus. 4,630,942, Cl. 384-8.000.
Tsumura, Akio; Hayashi, Shun-ichi; Miyaake, Chiharu; Ouuchi, Kazuo; and Yamamura, Yutaka, to Nitto Electric Industrial Co., Ltd. Peeling type developing apparatus. 4,631,110, Cl. 156-584.000.
Tsunoda, Eiichi: *See*—
Sakata, Hideo; and Tsunoda, Eiichi, 4,630,381, Cl. 33-503.000.
Tsunoda, Nagatoshi: *See*—
Hirano, Mutsuo; and Tsunoda, Nagatoshi, 4,630,519, Cl. 84-1.030.
Tucker, Peter G.: *See*—
Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; Conway, Richard J.; and Tucker, Peter G., 4,631,081, Cl. 71-94.000.
Tung, Lu H.; and Griggs, Jerald A., to Dow Chemical Company, The. Process for the polymerization of mixtures of cis and trans-isomers of 1,3-pentadiene in the production of block copolymers. 4,631,313, Cl. 525-250.000.
Tung, Lu H.; and Griggs, Jerald A., to Dow Chemical Company, The. Block copolymers utilizing a mixture of cis and trans-isomers of 1,3-pentadiene. 4,631,314, Cl. 525-314.000.
Tunturipyora Oy: *See*—
Saarinen, Sulevi, 4,630,818, Cl. 272-73.000.
Turczanski, Henryk: *See*—
Hill, John; Turczanski, Henryk; and Coote, Cyril E., 4,630,359, Cl. 29-602.00R.
Turlej, Zbigniew. Ionization smoke detector. 4,631,412, Cl. 250-381.000.
Turner, James J.: *See*—
Hollstein, Thomas E.; Turner, James J.; Mulder, Douglas C.; and O'Ryan, David E., 4,630,777, Cl. 239-707.000.
Turner, James R. Coin escrow apparatus for coin operated equipment. 4,630,624, Cl. 133-4.00A.
Turner, John H. W., to Alcan International Limited. Surface coating compositions. 4,631,087, Cl. 106-252.000.
Turner, Rudolf, to Zenith Electronics Corporation. Field responsive vertical pulse generator. 4,631,587, Cl. 358-148.000.
Twist, Michael; and Mundy, Paul, to Hawke Cable Glands Limited. Releasable coupling for tubes or pipes. 4,630,848, Cl. 285-308.000.
Uchida Manufacturing Co.: *See*—
Uchida, Tetsuei; Uchida, Tsutomu; Tsuchida, Nobuo; and Kazama, Susumu, 4,631,152, Cl. 261-4.000.
Uchida, Rokuroh; Nagasaki, Katsuhiko; Miyake, Yasunori; Ohno, Michio; Takeichi, Hitoshi; and Matsumoto, Hiroji, to Aloka Co., Ltd.; and Hayashi Electric Co., Ltd. Ultrasonic diagnostic apparatus. 4,630,612, Cl. 128-660.000.
Uchida, Takao: *See*—
Tanuma, Jiro; Uchida, Takao; and Hayashi, Kunihal, 4,631,457, Cl. 318-254.000.
Uchida, Tetsuei; Uchida, Tsutomu; Tsuchida, Nobuo; and Kazama, Susumu, to Uchida Manufacturing Co. Humidifier. 4,631,152, Cl. 261-4.000.
Uchida, Tsutomu: *See*—
Uchida, Tetsuei; Uchida, Tsutomu; Tsuchida, Nobuo; and Kazama, Susumu, 4,631,152, Cl. 261-4.000.
Uda, Tadayoshi: *See*—
Nishino, Yoshinori; Yamamoto, Masahiko; Uda, Tadayoshi; and Kanazawa, Tomoyoshi, 4,630,846, Cl. 285-21.000.
Ueda, Hiromobu: *See*—
Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hiromobu; Onoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, 4,631,106, Cl. 156-345.000.
Uemura, Hiroyuki: *See*—
Kawanishi, Toshiyuki; Shimada, Masaru; Murakami, Kakuji; Aruga, Tamotsu; and Uemura, Hiroyuki, 4,631,085, Cl. 106-22.000.
Uesaka, Yasutaro: *See*—
Shiiki, Kazuo; Shiroishi, Yoshihiro; Yuito, Isamu; Shinagawa, Kiminari; Uesaka, Yasutaro; Fujiwara, Hideo; and Nakamura, Hitoshi, 4,631,612, Cl. 360-125.000.
UF Genetics, Inc.: *See*—
Bonucci, Peter A., 4,630,393, Cl. 47-58.000.
Uick, Heidi J.: *See*—
Padden, Timothy J.; and Uick, Heidi J., 4,631,187, Cl. 424-70.000.
Umemoto, Teruo; and Ogura, Eiji, to Onoda Cement Company, Ltd.; and Sagami Chemical Research Center. Process for producing 5-fluorouracil. 4,631,342, Cl. 544-313.000.
Umemura, Kaoru: *See*—
Tamura, Hifumi; Shepherd, Clay; Ishitani, Toru; and Umemura, Kaoru, 4,631,448, Cl. 315-111.810.
Umetsu, Shinjiro; and Oyamada, Takashi, to Nippon Electric Co. Ltd. Portable radio device for protecting a radio circuit from static electricity. 4,631,640, Cl. 361-422.000.
Umezawa, Mitsuo: *See*—
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, 4,630,704, Cl. 180-247.000.
Umino, Takehito: *See*—
Yamamoto, Ikuo; Umino, Takehito; Shimoda, Yoshio; and Yoshino, Hisao, 4,631,172, Cl. 420-541.000.
Undin, Hans: *See*—
Wiener, Hans; and Undin, Hans, 4,630,462, Cl. 72-417.000.
Uni-Cardan Aktiengesellschaft: *See*—
Muller, Karl-Heinz; and Jordan, Alfons, 4,630,834, Cl. 277-212.6FB.
Unidyne, Inc.: *See*—
Perovich, Matthew J.; and Lang, James W., 4,630,599, Cl. 128-66.000.
Union Oil Company of California: *See*—
Biale, John, 4,631,235, Cl. 428-518.000.
UNIPHASE Corporation: *See*—
Crane, Dale E.; Jones, Robert E.; Watson, Mathew D.; and White, Alan D., 4,631,727, Cl. 372-33.000.
Uniroyal Chemical Company, Inc.: *See*—
Stieber, Joseph F., 4,631,316, Cl. 525-352.000.
Uniscope, Inc.: *See*—
Mommer, Richard P.; and Thomas, Johnny M., II, 4,631,192, Cl. 426-69.000.
United Kingdom Atomic Energy Authority: *See*—
Duddridge, John E.; and Kent, Christopher A., 4,631,135, Cl. 210-764.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Andrews, Beatrice M.; Carr, Neil; Gray, George W.; and Hogg, Christine, 4,630,897, Cl. 350-350.00R.
Rix, Clifford, 4,631,101, Cl. 156-175.000.
United States Elevator Corporation: *See*—
Lind, Larry W., 4,630,423, Cl. 52-484.000.
United States of America
Agriculture: *See*—
Arola, Rodger A.; and Sall, Hans-Olof, 4,630,658, Cl. 144-176.000.
Bergstrom, Gary C.; and Lambert, Michael B., 4,630,481, Cl. 73-437.000.
Han, Youn W., 4,631,258, Cl. 435-99.000.
Air Force: *See*—
Dolbeare, Richard T., 4,631,635, Cl. 361-383.000.
Dolland, Carlisle R., 4,631,474, Cl. 324-73.00R.

Jacavanco, Daniel, 4,631,547, Cl. 343-840.000.
O'Driscoll, Peter F., 4,631,154, Cl. 264-3.100.
Winch, Peter C.; and Blackledge, Mick, 4,630,437, Cl. 60-204.000.

Army: *See—*
Allan, Barry D., 4,630,683, Cl. 169-45.000.
Ballato, Arthur, 4,631,437, Cl. 310-369.000.
Brooke, Robert L.; McConnell, Peter J.; Testa, Anthony M.; and Maksymonko, George B., 4,630,470, Cl. 73-146.200.
Kronenberg, Stanley; McLaughlin, William L.; and Seibentritt, Carl R., Jr., 4,631,414, Cl. 250-474.100.
Supcoe, Robert F.; and Radakovich, Thomas, 4,631,302, Cl. 523-122.000.
Thorn, Lawrence B.; and Betts, Robert E., 4,630,539, Cl. 102-202.000.

Energy: *See—*
Tans, Petrus P.; and Lashof, Daniel A., 4,630,923, Cl. 356-301.000.

National Aeronautics and Space Administration: *See—*
Carreno, Victor A., 4,631,538, Cl. 340-870.180.
Daud, Taher; and Kachare, Akaram H., 4,631,352, Cl. 136-249.000.

Navy: *See—*
Friedman, Moshe; and Serlin, Victor, 4,631,447, Cl. 315-5.000.
Gennetten, Edward W.; and Gomez, Duane A., 4,631,586, Cl. 358-148.000.
Prickett, Michael J.; Mott, Murray H.; and Panos, Nicholas, 4,631,541, Cl. 343-5.0DP.
Rauscher, Christen, 4,631,500, Cl. 331-51.000.
Schiavone, Frank J., 4,631,505, Cl. 333-33.000.
Simons, Brent S., 4,631,728, Cl. 372-38.000.
Stutler, Richard A.; and Harris, Jeffrey T., 4,631,662, Cl. 364-200.000.
Supcoe, Robert F.; Singerman, Harold H.; and Whitacre, Jack E., 4,631,303, Cl. 523-177.000.
Taylor, Henry F.; Sigel, George H.; and Gingerich, Michael E., 4,630,883, Cl. 350-96.150.

U.S. Philips Corporation: *See—*
Corthout, Marc E. A.; and Mielekamp, Pieter M., 4,631,690, Cl. 364-518.000.
Easthill, Stephen P., 4,631,658, Cl. 364-184.000.
Felsner, Fritz; and Geier, Erich, 4,631,638, Cl. 361-415.000.
Geven, Willem J. A., 4,631,462, Cl. 318-318.000.
Houee, Yves L. P.; and Vacher, Pierre, 4,631,654, Cl. 363-21.000.
Kahlman, Josephus A. H. M.; and Baggen, Constant P. M. J., 4,631,714, Cl. 369-59.000.
Kasperkovitz, Wolfdietrich G., 4,631,499, Cl. 331-11.000.
Kayser, Harald; and Schmedemann, Walter, 4,630,796, Cl. 248-648.000.
Smithers, Colin R., 4,631,491, Cl. 330-149.000.
Tran Kiem, Nguyen, 4,631,502, Cl. 332-16.00T.
Wolter, Joachim H.; and Horstman, Robert E., 4,631,731, Cl. 372-74.000.

United States Postal Service: *See—*
Hoseley, Rex A., 4,630,712, Cl. 184-15.300.

United Technologies Corporation: *See—*
Scola, Daniel A.; and Pater, Ruth H., 4,631,335, Cl. 528-353.000.

Universal Security Instruments, Inc.: *See—*
De Witt, Kenneth I.; and Kovens, Michael L., 4,631,527, Cl. 340-539.000.

University E.M., Inc.: *See—*
Barsan, William G., 4,631,294, Cl. 514-557.000.

University of Houston, The: *See—*
Lucas, Ronald J.; Berry, Ivan L.; and Wolfe, John C., 4,631,704, Cl. 365-126.000.

University of Illinois: *See—*
Rinehart, Kenneth L., Jr.; Harbour, Gary C.; and Kobayashi, Jun'ichi, 4,631,149, Cl. 540-546.000.

University of Michigan, Board of Regents of The: *See—*
Clewell, Don B.; and Gawron-Burke, Mary C., 4,631,259, Cl. 435-172.300.

University of Minnesota, Regents of the: *See—*
Haygreen, John G., 4,630,535, Cl. 100-127.000.

Upjohn Company, The: *See—*
Guyer, Thomas L.; and Franz, Robert M., 4,631,305, Cl. 523-400.000.

Urban, Ted. F., to Lamico, Inc. Crutch tip construction. 4,630,626, Cl. 135-84.000.

Urui, Kiyoshi: *See—*
Ikawa, Yasuo; Shibata, Tadashi; Urui, Kiyoshi; Miyata, Misao; Kawamura, Masahiko; and Amano, Noboru, 4,631,686, Cl. 364-490.000.

Usami, Ryuuzi, to Casio Computer Co., Ltd. Electronic musical instrument. 4,630,518, Cl. 84-1.030.

Ushida, Minoru: *See—*
Fukunaga, Tokio; Magara, Takuji; Sakabe, Shigekazu; Aramaki, Jun; Karashima, Toshiharu; and Ushida, Minoru, 4,631,382, Cl. 219-69.00R.

Ushijima, Takao; and Yamazaki, Harumichi, to Bridgestone Corporation. Vibration isolating devices. 4,630,808, Cl. 267-140.100.

Ushijima, Yasuhiro: *See—*
Kitagawa, Tohru; Sakamoto, Koichiro; and Ushijima, Yasuhiro, 4,630,491, Cl. 73-862.670.

USM Corporation: *See—*
Bender, Rudolf; Dietrich, Hans-Gerd; and Giebel, Gerhard, 4,630,325, Cl. 12-8.100.
Mauer, Dieter, 4,630,460, Cl. 72-391.000.
Osterland, Robert W.; and Benedetti, Nicholas M., 4,630,338, Cl. 24-293.000.

Usui, Eiki; and Kawaguchi, Masahiro, to Kabushiki Kaisha Kobe Seiko Sho. Surface-treated aluminum alloy substrates for magnetic disks. 4,631,112, Cl. 156-644.000.

USV Pharmaceutical Corp.: *See—*
Chakraborty, Utpal R.; and Youssefyeh, Raymond D., 4,631,287, Cl. 514-307.000.

Utilitech, Incorporated: *See—*
Kinnan, Frank R., 4,630,972, Cl. 405-269.000.

Utsumi, Yoshihiro, to Pioneer Electronic Corporation. Focus error detection device. 4,631,396, Cl. 250-201.000.

Uytterhoeven, Herman: *See—*
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Uytterhoeven, Herman; de Winter, Walter; Hoffarth, Gunther; and Richter, Wolfgang, 4,631,243, Cl. 430-114.000.

Vacco Industries: *See—*
Keith, Robert C.; VandenBerg, Teunis; Randolph, Marshall C.; Lewis, Thomas B.; and Gillis, Patrick J., Jr., 4,631,126, Cl. 210-108.000.

Vacher, Pierre: *See—*
Houee, Yves L. P.; and Vacher, Pierre, 4,631,654, Cl. 363-21.000.

Vallery, Stafford J., to Armstrong International, Inc. Steam trap checker. 4,630,633, Cl. 137-185.000.

Valteris, Ramunas L.; and Caldwell, Gary L., to Du Pont de Nemours, E. I., and Company. Plate, foam and screen filament quenching apparatus. 4,631,018, Cl. 425-445.000.

van Alst, Wilhelmus B. T., to Du Pont de Nemours, E. I., and Company. IDC latching terminal. 4,630,879, Cl. 339-99.00R.

VandenBerg, Teunis: *See—*
Keith, Robert C.; VandenBerg, Teunis; Randolph, Marshall C.; Lewis, Thomas B.; and Gillis, Patrick J., Jr., 4,631,126, Cl. 210-108.000.

Van Gompel, Paul T., to Kimberly-Clark Corporation. Garment with one or more gusseted adjustable openings and method of making the same. 4,630,320, Cl. 2-406.000.

Van Heek, Karl H.: *See—*
Wagener, Heinrich; Kirchhoff, Reinhold; Van Heek, Karl H.; and Juntgen, Harald, 4,630,479, Cl. 73-863.830.

van Husen, Hendrik, to GTE Communication Systems Corp. Power distribution system. 4,631,655, Cl. 363-50.000.

van Rooden, Bernardus J.: *See—*
Trevino, Jose L.; and van Rooden, Bernardus J., 4,631,312, Cl. 525-221.000.

Varian S.p.A.: *See—*
Pierini, Marco, 4,631,002, Cl. 417-49.000.

Varnelis, Edmund K.: *See—*
Siewert, Robert L.; and Varnelis, Edmund K., 4,630,698, Cl. 180-69.240.

VDO Adolf Schindling AG: *See—*
Angermuller, Helmut; and Hahlganss, Gunther, 4,631,678, Cl. 364-424.000.

Veaux, Jacques; and Derrien, Michel, to Messier-Hispano-Bugatti (S.A.). Aircraft landing gear, in particular for helicopters. 4,630,788, Cl. 244-104.0FP.

Veeder Industries, Inc.: *See—*
Fleischer, Donald W.; and Smilgys, Bruno S., 4,630,655, Cl. 141-198.000.

Vendelin, George D.; and Rezvani, Behruz, to Eaton Corporation. Circuit for DC biasing. 4,631,493, Cl. 330-277.000.

Venetjoki, Juhani T., to Lokari-Tuote Oy; and Auto Lokari Oy. Vehicle steering mechanism. 4,630,701, Cl. 180-209.000.

Verespej, Michael A.: *See—*
Bauer, Alajos Z.; and Verespej, Michael A., 4,630,362, Cl. 29-751.000.

Vergona, Albert B., to Eastman Kodak Company. Color imaging apparatus using electro-optic modulators. 4,631,551, Cl. 346-108.000.

Verzilli, Giuseppe; and Schmid, Rene, to Rieter Machine Works Limited. Apparatus for doubling a fiber web. 4,630,337, Cl. 19-296.000.

Vickers, James H., to Southco, Inc. Adjustable friction hinge. 4,630,333, Cl. 16-338.000.

Victor Company of Japan, Ltd.: *See—*
Hishiki, Hideo; and Kamiyama, Yukio, 4,631,512, Cl. 338-48.000.
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,631,717, Cl. 369-276.000.

Video Dynamics, Inc.: *See—*
Grossman, Craig B.; Schwartz, Mark A.; and Hammer, Stanley S., 4,631,615, Cl. 360-128.000.

Video-7 Incorporated: *See—*
Broedner, Walter F., 4,631,692, Cl. 364-518.000.

Villanyi, Sigmund T., to RCA Corporation. Multibeam electron gun having a formed transition member. 4,631,443, Cl. 313-417.000.

Villiger, Alois: *See—*
Petrzilka, Martin; and Villiger, Alois, 4,630,896, Cl. 350-350.00R.

Viskochil, Stephen R., to Priam Corporation. Linear motor having improved magnetic characteristics. 4,631,431, Cl. 310-13.000.

Vock, Manfred H.: *See—*
Courtney, Thomas F., Jr.; Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; and Wiener, Charles, 4,631,194, Cl. 426-535.000.

Voege, Herbert: *See—*
Stendel, Wilhelm; and Voege, Herbert, 4,631,231, Cl. 428-413.000.

Voest-Alpine Aktiengesellschaft: *See*—
Buchegger, Rudolf; and Langeder, Rudolf, 4,630,785, Cl. 242-72.100.

Vogg, Hubert: *See*—
Maul, Sonja; Buttner, Erwin; Meichelbock, Heiner; Merz, Albert; and Vogg, Hubert, 4,630,464, Cl. 73-28.000.

Volker, Wolfgang; and Thoma, Klemens, to Messer Griesheim GmbH. Apparatus for low temperature storage of biological or pharmaceutical samples. 4,630,873, Cl. 312-209.000.

Volkmann, Robert A., to Pfizer Inc. Thiazole precursors for the preparation of biotin. 4,631,345, Cl. 548-147.000.

Von Arx AG: *See*—
Dummermuth, Paul, 4,630,687, Cl. 173-131.000.

von Hagen, Ingo; Hillenbrand, Hans-Georg; and Popperling, Rolf K., to Mannesmann AG. Steel that is exposed to hydrogen sulfide. 4,631,095, Cl. 148-12.00F.

von Ronai-Horvath, Michael: *See*—
Hartmannsgruber, Max; von Ronai-Horvath, Michael; Seebo, Kurt; and Schoenung, Bernhard, 4,630,434, Cl. 57-87.000.

von Weissenfluh, Beat, to Hawe-Neos Dental Dr. H. von Weissenfluh S.A. Equipment for putting in approximal fillings with light-hardening materials. 4,631,030, Cl. 433-149.000.

Vorbruggen, Helmut; Elger, Walter; Town, Michael-Harold; and Schillinger, Ekkehard, to Schering Aktiengesellschaft. Prostaglandins and prostacyclins, process for their preparation and their use as medicaments. 4,631,276, Cl. 514-211.000.

Voss, Thomas, to ZF-Herion-Systemtechnik GmbH. Electronic controller for cyclically operating machinery. 4,631,722, Cl. 371-9.000.

Votava, Ronald, to Avondale Industries, Inc. Transfer feed mechanism for power presses. 4,630,461, Cl. 72-405.000.

Vu, Tho T.: *See*—
Nelson, Roderick D.; and Vu, Tho T., 4,631,426, Cl. 307-450.000.

W. R. Grace & Co.: *See*—
Gokel, George W.; and Echegoyen, Luis, 4,631,119, Cl. 204-59.00R.
Winyall, Milton E.; and Harville, Cathy L., 4,631,184, Cl. 424-49.000.

W. Schlafhorst & Co.: *See*—
Rohner, Joachim, 4,630,782, Cl. 242-18.0EW.

Waaben, Sigurd G.: *See*—
Federico, Joseph; and Waaben, Sigurd G., 4,631,355, Cl. 178-18.000.

WABCO Westinghouse Fahrzeugbremsen GmbH: *See*—
Klatt, Alfred, 4,630,508, Cl. 74-866.000.
Klatt, Alfred, 4,631,679, Cl. 364-424.100.

WABCO Westinghouse Steuerungstechnik GmbH & Co.: *See*—
Brausfeld, Walter; and Meyer, Ernst-August, 4,630,800, Cl. 251-324.000.

Wacom Co., Ltd.: *See*—
Taguchi, Yoshinori; and Yamanami, Tsuguya, 4,631,356, Cl. 178-19.000.

Wada, Hiroshi: *See*—
Takino, Kiyoko; Asahi, Hidetoshi; and Wada, Hiroshi, 4,631,255, Cl. 435-37.000.

Wada, Yoshio: *See*—
Sadamatsu, Hiroshi; Wada, Yoshio; and Ito, Hideaki, 4,631,419, Cl. 307-255.000.

Wagener, Heinrich; Kirchhoff, Reinhold; Van Heek, Karl H.; and Juntgen, Harald, to Bergwerksverband GmbH. Sampling device for solids in a pressurized reactor. 4,630,479, Cl. 73-863.830.

agner, Joseph P.: *See*—
Sliger, Boyd P.; and Wagner, Joseph P., 4,630,770, Cl. 236-34.500.

Wakata, Hideo: *See*—
Imoto, Yuzo; Wakata, Hideo; Takei, Toshihiro; Hattori, Yoshiyuki; and Nomura, Yoshihisa, 4,630,871, Cl. 303-113.000.

Waldorf Corporation: *See*—
Kennedy, Kenneth V., 4,631,046, Cl. 493-59.000.

Walker, Haywood A., Jr.: *See*—
Schaefer, Rolf; and Walker, Haywood A., Jr., 4,631,203, Cl. 427-145.000.

Wallentowitz, Henning: *See*—
Werner, Hans; Knothe, Frank; Graf, Paul; Wallentowitz, Henning; Keller, Hans-Hermann; and Kist, Alfred, 4,630,803, Cl. 267-8.00R.

Waller, David P.: *See*—
Simon, Myron S.; and Waller, David P., 4,631,344, Cl. 548-146.000.

Walsh, Fraser M., to Tracer Technologies, Inc. Electrochemical cell. 4,631,240, Cl. 429-105.000.

Walsh, Joseph F.; and Dean, William P., to IQ Technologies, Inc. Interface apparatus. 4,631,698, Cl. 364-900.000.

Waltec Inc.: *See*—
Thomson, David G., 4,630,647, Cl. 138-99.000.

Waltenspuhl, Rolf, to Stoping Aktiengesellschaft. Integral casting apparatus for use in continuous casting of molten metal. 4,630,668, Cl. 164-437.000.

Walter, Horst: *See*—
Schaaf, Heinz; and Walter, Horst, 4,630,533, Cl. 99-353.000.

Walton, Paul G.; and Little, Percy A. Integral blade hole opener. 4,630,694, Cl. 175-391.000.

Wang Laboratories, Inc.: *See*—
Bergeron, Lawrence E.; Daly, Daniel F.; and Grosso, Elaine C., 4,631,746, Cl. 381-35.000.
El-Sherbini, Ahmed M., 4,631,521, Cl. 340-347.0DD.

Ward, Donald H.; and Tomashek, James R., to Hughes Tool Company. Multiplex submersible pump telemetry system. 4,631,536, Cl. 340-857.000.

Ward, Russell G. Multiposition rotary switch with phototransistors. 4,631,399, Cl. 250-221.000.

Warner-Lambert K.K.: *See*—
Imaizumi, Yoshikatsu, 4,630,365, Cl. 30-53.000.

Warner & Swasey Company, The: *See*—
Raleigh, Freddie L., 4,630,374, Cl. 33-1.00M.

Warren, Gerald K.; and Sandroni, Raffaele. Input torque control device. 4,631,005, Cl. 417-218.000.

Warthen, Joel W. Winch-powered wood splitter. 4,630,659, Cl. 144-193.00R.

Washizawa, Yoshikazu: *See*—
Yamada, Kozo; and Washizawa, Yoshikazu, 4,630,699, Cl. 180-75.000.

Wastl, Max, Sr., to Lafayette Instrument Co., Inc. Gas or low volume liquid flow meter. 4,630,485, Cl. 73-861.560.

Watanabe, Isao: *See*—
Miyaji, Kenichi; Toida, Shouji; Ito, Seiichi; Watanabe, Isao; and Kishida, Masatoshi, 4,630,742, Cl. 215-13.00R.

Watanabe, Junji, to Kabushiki Kaisha Toshiba. Combined printer-copier apparatus. 4,630,921, Cl. 355-3.0SH.

Watanabe, Kainen; Yasuhara, Hiroto; Sugiyama, Toru; Shimizu, Keiji; and Murata, Yoshihiro, to Matsushita Electric Industrial Co., Ltd.; and Japanese National Railways. Insulating plate for rail insulated joint. 4,630,772, Cl. 238-159.000.

Watanabe, Kazuyoshi: *See*—
Maeda, Hirofumi; Watanabe, Kazuyoshi; Akamatsu, Naruhiko; Senda, Kenichi; and Nishioka, Shunichi, 4,631,159, Cl. 264-53.000.

Watanabe, Kuniaki: *See*—
Tsuboi, Masaharu; and Watanabe, Kuniaki, 4,631,469, Cl. 322-42.000.

Watanabe, Masaharu, to Terumo Corporation. Plasma separator. 4,631,130, Cl. 210-651.000.

Watanabe, Minoru, to Kabushiki Kaisha Morita Seisakusho. Dental chair. 4,630,862, Cl. 297-167.000.

Watanabe, Takayuki, to NEC Corporation. Memory circuit with power supply voltage detection means. 4,631,707, Cl. 365-226.000.

Watanabe, Tomoyuki: *See*—
Tokoro, Setsuo; Shigematsu, Takashi; and Watanabe, Tomoyuki, 4,631,043, Cl. 474-18.000.

Watanabe, Toshiyuki; and Yamada, Noboru, to Kabushiki Kaisha Toshiba. Method of and device for detecting displacement of paper sheets. 4,630,813, Cl. 271-227.000.

Watanabe, Tsukasa: *See*—
Kakinuma, Hiroaki; Nishikawa, Satoshi; and Watanabe, Tsukasa, 4,631,198, Cl. 427-38.000.

Watanabe, Yoshitaka; and Endo, Takashi, to Canon Kabushiki Kaisha. Liquid jet recording apparatus. 4,631,556, Cl. 346-140.00R.

Watjen, Frank: *See*—
Petersen, Erling N.; Jensen, Leif H.; Watjen, Frank; and Seidelmann, Dieter, 4,631,285, Cl. 514-292.000.

Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; Conway, Richard J.; and Tucker, Peter G., to ICI Australia Limited. Herbicidal cyclohexane-1,3-dione derivatives. 4,631,081, Cl. 71-94.000.

Watson, Mathew D.: *See*—
Crane, Dale E.; Jones, Robert E.; Watson, Mathew D.; and White, Alan D., 4,631,727, Cl. 372-33.000.

Watters, James Virgil: *See*—
Hill, Charles C., 4,630,816, Cl. 272-70.000.

Weatherford/Lamb, Inc.: *See*—
True, Martin E.; and Sullivan, Clarence W., 4,630,688, Cl. 173-163.000.

Webasto-Werk W. Baier GmbH & Co: *See*—
Fuerst, Arpad; and Lutz, Alfons, 4,630,860, Cl. 296-217.000.

Webasto-Werk W. Baier GmbH & Co.: *See*—
Bienert, Horst; and Kohlpaintner, Georg, 4,630,859, Cl. 296-217.000.

Webb, Jimmy L.; and Olsen, Cathryn E., to General Electric Company. Silyl carbamates and their use in the preparation of bis (aminoalkyl) disiloxanes. 4,631,346, Cl. 556-420.000.

Webber, William T. Regenerated internal combustion engine. 4,630,447, Cl. 60-712.000.

Weber, Wilfried: *See*—
Schopwinkel, Theo; and Weber, Wilfried, 4,630,336, Cl. 19-288.000.

Wedgtrac Corporation: *See*—
Nelson, Bertel S., 4,630,497, Cl. 74-425.000.

Weekly, Max D.: *See*—
Foster, Robert W.; and Weekly, Max D., 4,631,363, Cl. 379-15.000.

Weeks, Harry D. Corn head assembly for harvesting corn. 4,630,430, Cl. 56-14.100.

Weerda, Hilko; and Pedersen, Peter, to Dragerwerk AG. Device for determining and evaluating the pressure in a balloon sleeve of a closed tracheal tube. 4,630,606, Cl. 128-207.140.

Weinlich, Karl: *See*—
Sauerwein, Kurt; Kinzer, Norbert; and Weinlich, Karl, 4,631,415, Cl. 250-497.100.

Weiss, Donald: *See*—
Germanton, Damon; and Weiss, Donald, 4,631,350, Cl. 136-225.000.

Weitzman, Harry L., to Weitzman, Jack J. Prefabricated knock-down metal-frame work table. 4,630,550, Cl. 108-155.000.

Weitzman, Jack J.: *See*—
Weitzman, Harry L., 4,630,550, Cl. 108-155.000.

Weld-Equip b.v.: *See*—
Tijs, Hendricus C. P., 4,630,529, Cl. 92-13.000.

Wellman, Donald C.; and Clark, William E., to Carrier Corporation. Variable volume multizone system. 4,630,670, Cl. 165-16.000.

Welygan, Dennis G.; and Zemke, Ronald O., to Minnesota Mining and Manufacturing Company. Extruded article and method of making the same. 4,631,215, Cl. 428-105.000.

Wendt, Frank S., to RCA Corporation. Frequency controlled resonant regulator. 4,631,652, Cl. 363-16.000.

Wenzel, Werner: *See—*
Evers, Reinhard; and Wenzel, Werner, 4,630,334, Cl. 17-56.000.

Wermuth, Camille-Georges: *See—*
Kan, Jean-Paul; Biziere, Kathleen; and Wermuth, Camille-Georges, 4,631,280, Cl. 514-247.000.

Werner, Hans; Knothe, Frank; Graf, Paul; Wallentowitz, Henning; Keller, Hans-Hermann; and Kist, Alfred, to Daimler-Benz Aktiengesellschaft. Suspension-strut mounting for installation between a shock-absorber strut or spring strut and a vehicle body spring-supported with respect to the axles, in particular of a motor vehicle. 4,630,803, Cl. 267-8.00R.

Wessel, Wolf: *See—*
Kuttner, Thomas; Straubel, Max; and Wessel, Wolf, 4,630,582, Cl. 123-339.000.

West, Fred D. Fiber optic cable cleaving tool. 4,630,764, Cl. 225-2.000.

Westall, Stephen, to Dow Corning, Ltd. Organosiloxane-oxyalkylene copolymers. 4,631,208, Cl. 427-387.000.

Western Geophysical Co. of America: *See—*
Jubinski, Paul, 4,630,884, Cl. 350-96.150.

Westfalia Separator AG: *See—*
Zettier, Karl H., 4,631,049, Cl. 494-71.000.

Westinghouse Electric Corp.: *See—*
Camden, Thomas M., Jr., 4,631,166, Cl. 376-435.000.
Cavada, David R.; and Golick, Leonard R., 4,630,410, Cl. 51-410.000.
Leone, David A., 4,631,376, Cl. 200-306.000.
Mallick, George T., Jr., 4,631,629, Cl. 361-154.000.
Mark, Richard H., Jr., 4,631,533, Cl. 340-721.000.
Neuner, James A.; Boomgaard, Dirk J.; Wilbur, Susan A.; and Geis, Charles G., 4,631,537, Cl. 340-870.170.
Ray, John R.; Williamson, Michael A.; and Smith, James D. B., 4,631,325, Cl. 526-220.000.
Ruka, Roswell J., 4,631,238, Cl. 429-30.000.
Shallenberger, John M.; and Ferlan, Stephen J., 4,631,168, Cl. 376-446.000.
Sherwin, Gary W., 4,631,466, Cl. 318-696.000.
Spurrier, Francis R.; Pierce, Bill L.; and Wright, Maynard K., 4,631,239, Cl. 429-39.000.
Wilson, John F.; and Doshi, Pratap K., 4,631,165, Cl. 376-333.000.

Weston, Randall L.: *See—*
Zimmerman, Karen A.; Weston, Randall L.; and Thomas, Richard D., 4,630,472, Cl. 73-161.000.

Westra, Leonard F.; Woodroffe, Jaime A.; and Stickler, David B., to Gas Research Institute. Method and apparatus for the heat processing of glass and glass forming material. 4,631,080, Cl. 65-134.000.

Wheatley, Carl F., Jr.: *See—*
Neilson, John M. S.; Wheatley, Carl F., Jr.; and Brackelmanns, Norbert W., 4,631,564, Cl. 357-23.400.

Wheeler, William J., to Eli Lilly and Company. 1,3,5-triazepinones. 4,631,339, Cl. 540-492.000.

Whipple, David C.: *See—*
Drescher, Robert D.; Eisenhaure, David B.; Hockney, Richard L.; Johnson, Bruce G.; St. George, Emery, Jr.; and Whipple, David C., 4,631,456, Cl. 318-140.000.

Whitacre, Jack E.: *See—*
Supcoe, Robert F.; Singerman, Harold H.; and Whitacre, Jack E., 4,631,303, Cl. 523-177.000.

White, Alan D.: *See—*
Crane, Dale E.; Jones, Robert E.; Watson, Mathew D.; and White, Alan D., 4,631,727, Cl. 372-33.000.

White, Arthur A. Compact golf swing training and practice device. 4,630,829, Cl. 273-186.00A.

White, Justin C.: *See—*
Sayler, William H.; and White, Justin C., 4,630,554, Cl. 110-264.000.

White, Robert M.; and Brancher, Rodney E., to InterMetro Industries Corporation. Latching mechanism. 4,630,852, Cl. 292-87.000.

White, W. Curtis: *See—*
Blehm, Lynne; Makek, James R.; and White, W. Curtis, 4,631,273, Cl. 514-29.000.

Whiteside, George D., to Polaroid Corporation. Wet processing web camera and method. 4,630,912, Cl. 354-88.000.

Whiteside, George D.; and Cavallaro, Robert E., to Polaroid Corporation. Multipart cassette for two component film system. 4,630,915, Cl. 354-275.000.

Whitfield, Roger R. Fluid handling device useful as a pump, compressor or rotary engine. 4,631,011, Cl. 418-68.000.

Whiting, Montague. Device and method for loading and transporting elongate objects on the tops of vehicles. 4,630,990, Cl. 414-462.000.

Wickmann, John T.; and Olak, Richard, to Chart Industries Limited. Laser gauging system and component parts therefor. 4,630,379, Cl. 33-288.000.

Wiener, Charles: *See—*
Courtney, Thomas F., Jr.; Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; and Wiener, Charles, 4,631,194, Cl. 426-535.000.

Wiener, Hans; and Undin, Hans, to C. A. Weidmuller GmbH & Co. Tool for crimping cable shoe terminals. 4,630,462, Cl. 72-410.000.

Wiff, Donald R.: *See—*
Hwang, Wen-Fang; Wiff, Donald R.; and Helminiak, Thaddeus E., 4,631,318, Cl. 525-432.000.

Wiger, Henry K.; and Katz, Manfred, to Pullman Standard Inc. Double groove center sill. 4,630,546, Cl. 105-416.000.

Wiger, Henry K.; and Przybylinski, Phillip G., to Pullman Standard Inc. Center sill horizontal divider. 4,630,548, Cl. 105-416.000.

Wiggins, Richard H., Jr.: *See—*
Breedlove, Paul S.; Moore, James H.; Brantingham, George L.; and Wiggins, Richard H., Jr., 4,631,748, Cl. 381-51.000.

Wilbur, Susan A.: *See—*
Neuner, James A.; Boomgaard, Dirk J.; Wilbur, Susan A.; and Geis, Charles G., 4,631,537, Cl. 340-870.170.

Wilcock, Donald F.: *See—*
Stahl, Philip; Wilcock, Donald F.; and Fuller, Dudley D., 4,630,943, Cl. 384-133.000.

Wilder, Charles R., to Phillips Petroleum Company. Novel carbon black and process for preparing same. 4,631,304, Cl. 523-215.000.

Wilkerson Corporation: *See—*
Null, Robert A.; Laughlin, Lonnie C.; and Goldberg, Michael L., 4,631,073, Cl. 55-18.000.

Willat, Boyd, to Harper House, Inc. Binder. 4,630,843, Cl. 281-30.000.

Willenbrock, Horst: *See—*
Zweiniger, Hansjurgen; and Willenbrock, Horst, 4,630,857, Cl. 296-37.120.

Willett, John T.: *See—*
Stewart, Douglas V.; Tabereaux, Alton T.; and Willett, John T., 4,631,121, Cl. 204-243.00R.

Williams, Brian H.: *See—*
Martens, John A.; and Williams, Brian H., 4,631,229, Cl. 428-343.000.

Williams, James T.: *See—*
Connors, Robert H.; and Williams, James T., 4,630,695, Cl. 177-1.000.

Williams, Richard L., Jr., to Ford Aerospace & Communications Corporation. Velocity and attitude control for exoatmospheric projectile. 4,630,790, Cl. 244-169.000.

Williamson, Archie O. Hydraulic-controlled differential. 4,630,505, Cl. 74-711.000.

Williamson, Michael A.: *See—*
Ray, John R.; Williamson, Michael A.; and Smith, James D. B., 4,631,325, Cl. 526-220.000.

Williston, David W., to Du Pont de Nemours, E. I., and Company. Dichromic process for preparation of conductive circuit. 4,631,111, Cl. 156-630.000.

Wills, Joseph T.: *See—*
Spicer, Barry; and Wills, Joseph T., 4,631,077, Cl. 55-487.000.

Wilson, Arthur K. Reversible picture frame. 4,630,386, Cl. 40-155.000.

Wilson, Bob T.: *See—*
Park, Arthur; and Wilson, Bob T., 4,631,677, Cl. 364-422.000.

Wilson, James A.; and Ellis, James R., to Holland Hitch Company. Portable stock handling unit. 4,630,570, Cl. 119-20.000.

Wilson, John F.; and Doshi, Pratap K., to Westinghouse Electric Corp. Boiling water reactor control rod. 4,631,165, Cl. 376-333.000.

Wilson, Leonard T.: *See—*
Giorgio, Nicholas A.; Krupey, John; and Wilson, Leonard T., 4,631,254, Cl. 435-7.000.

Wimer, Oley D.: *See—*
Sparacia, Frank M.; and Wimer, Oley D., 4,631,409, Cl. 250-361.00R.

Winch, Peter C.; and Blackledge, Mick, to United States of America, Air Force. Optical control method for solid fuel rocket burn rate. 4,630,437, Cl. 60-204.000.

Windischbauer, Florian, to Aktiengesellschaft Adolph Saurer. Apparatus for the constrained actuation of the clamping system of filling-yarn insertion devices in shuttleless weaving machines. 4,630,651, Cl. 139-446.000.

Windows, David W.; and Burback, Ronald E. Collapsible frame structure. 4,630,627, Cl. 135-112.000.

Wine, Charles M., to RCA Corporation. Apparatus for synchronizing the operation of a microprocessor with a television synchronization signal useful in generating an on-screen character display. 4,631,585, Cl. 358-148.000.

Wingate, Sidney A., to Dynamics Research Corporation. Position encoder compensation system. 4,631,520, Cl. 340-347.0CC.

Wingler, Frank; Koch, Otto; Lindner, Christian; and Reinking, Klaus, to Bayer Aktiengesellschaft. Acrylonitrile free blends of a polycarbonate, a graft rubber and a terpolymer resin. 4,631,311, Cl. 525-67.000.

Winyall, Milton E.; and Harville, Cathy L., to W. R. Grace & Co. Dialytic silica dentifrice. 4,631,184, Cl. 424-49.000.

Wisconsin Alumni Research Foundation: *See—*
Nickles, Robert J., 4,631,410, Cl. 250-363.00R.

Wismann, Horst. Casting device for dental casts. 4,630,666, Cl. 164-155.000.

Witco Corporation: *See—*
Christhilf, Harold H.; Morrison, Paul E.; and Niemczura, Paul W., 4,631,083, Cl. 106-14.230.

Witschi, Heinz: *See—*
Thomann, Roland; Witschi, Heinz; Brink, Heinz-Deiter; and Amann, Markus, 4,630,962, Cl. 404-2.000.

Woffinden, Gary A.; Amdahl, Gene M.; and Hanson, Donald L., to Amdahl Corporation. Addressing system for an associative cache memory. 4,631,660, Cl. 364-200.000.

Wogatzke, Horst: *See*—
Burkhardt, Horst; Ernst, Alfons; Dangschat, Holmer; and Wogatzke, Horst, 4,631,404, Cl. 250-237.00G.
Wold, Johnny; and Kristiansen, Leif A., to Norsk Hydro a.s. Catalyst for conversion of methanol. 4,631,266, Cl. 502-324.000.
Wold, Robert E., to Johnstone Pump Company. Magnadrum pump assembly. 4,630,760, Cl. 222-387.000.
Wolfe, John C.: *See*—
Lucas, Ronald J.; Berry, Ivan L.; and Wolfe, John C., 4,631,704, Cl. 365-126.000.
Wolter, Joachim H.; and Horstman, Robert E., to U.S. Philips Corporation. Device for producing or amplifying coherent radiation. 4,631,731, Cl. 372-74.000.
Wolvek, Sidney; Kaiser, Walter; and Kaltenbach, Kenneth, to Datascope Corp. Sheath remover. 4,631,059, Cl. 604-280.000.
Wood, David H.; and Creswick, Martin, to Senelco Limited. Transmitter/responder systems. 4,631,708, Cl. 367-2.000.
Woodroffe, Jaime A.: *See*—
Westra, Leonard F.; Woodroffe, Jaime A.; and Stickler, David B., 4,631,080, Cl. 65-134.000.
Woods, Harold T., to Multifastener Corporation. Sealed nut and panel assembly apparatus. 4,630,363, Cl. 29-798.000.
Wright, David M., to Sunbeam Plastics Corporation. Tamper indicating child resistant closure. 4,630,743, Cl. 215-216.000.
Wright Line, Inc.: *See*—
King, Ronald R., 4,630,737, Cl. 211-40.000.
Wright, Maynard K.: *See*—
Spurrier, Francis R.; Pierce, Bill L.; and Wright, Maynard K., 4,631,239, Cl. 429-39.000.
Wu, Dan T.: *See*—
Korte, Kevin R.; and Wu, Dan T., 4,630,619, Cl. 131-296.000.
Wyman, Ransome J. Polymer concrete by percolation. 4,630,963, Cl. 404-75.000.
Xerox Corporation: *See*—
Fantuzzo, Joseph; and Monkelbaan, Edwin R., 4,630,919, Cl. 355-4.000.
Figueira, Stephen; and Billings, Philip A., 4,630,722, Cl. 192-84.00T.
Handy, Roland J., 4,631,739, Cl. 377-60.000.
Silverberg, Mort; Maus, Richard G.; and Lindblad, Nero R., 4,630,920, Cl. 355-15.000.
Xidex Corporation: *See*—
Harper, Bruce; and Kemp, Horace N., 4,630,427, Cl. 53-460.000.
Yaguchi, Tatsuya, to Canon Kabushiki Kaisha. Image communications apparatus for long-size copy image. 4,631,596, Cl. 358-256.000.
Yamabe, Masaaki; Kobayashi, Shigeyoshi; Yoshihara, Noriyuki; and Nakamura, Masaru, to Asahi Glass Company Ltd. Composite membrane for gas separation. 4,631,075, Cl. 55-158.000.
Yamada, Kimichika; and Miyazaki, Takao, to Clarion Co., Ltd. Automatic camera control system. 4,631,590, Cl. 358-185.000.
Yamada, Kozo; and Washizawa, Yoshikazu, to Honda Giken Kogyo Kabushiki Kaisha. Driving wheel supporting system. 4,630,699, Cl. 180-75.000.
Yamada, Noboru: *See*—
Watanabe, Toshiyuki; and Yamada, Noboru, 4,630,813, Cl. 271-227.000.
Yamada, Setsuo: *See*—
Minemura, Norihiro; Takabayashi, Fumiki; and Yamada, Setsuo, 4,631,066, Cl. 8-115.560.
Yamaguchi, Kazuhiko: *See*—
Mizumoto, Mamoru; Yamashita, Hisao; Matsuda, Shinpei; and Yamaguchi, Kazuhiko, 4,631,263, Cl. 502-159.000.
Yamaguchi, Keiki; Higashiizumi, Takao; Shimazaki, Toru; Sano, Shinichi; and Takeuchi, Yasuhito, to Yokogawa Medical Systems, Limited. Azimuth adaptive phased array sonar. 4,631,710, Cl. 367-103.000.
Yamahata, Takashi: *See*—
Ikawa, Osamu; and Yamahata, Takashi, 4,631,232, Cl. 428-413.000.
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, to Fuji Jukogyo Kabushiki Kaisha. System for controlling a power transmission of a four-wheel drive vehicle. 4,630,704, Cl. 180-247.000.
Yamamoto, Haruyasu; Kasamatsu, Kiyoshi; Okabe, Takayuki; and Mukai, Kunio, to Sumitomo Chemical Company, Limited. Dithiolphosphoric acid esters. 4,631,347, Cl. 260-963.000.
Yamamoto, Ikuo; Umino, Takehito; Shinoda, Yoshio; and Yoshino, Hisao, to Nadagawa Corrosion Protecting Co., Ltd.; and Mitsui Mining & Smelting Co. Aluminum alloys for galvanic anode. 4,631,172, Cl. 420-541.000.
Yamamoto, Masahiko: *See*—
Nishino, Yoshinori; Yamamoto, Masahiko; Uda, Tadayoshi; and Kanazawa, Tomoyoshi, 4,630,846, Cl. 285-21.000.
Yamamoto, Susumu: *See*—
Fujioka, Souichirou; Inaji, Toshio; and Yamamoto, Susumu, 4,631,459, Cl. 318-254.000.
Yamamoto, Yasuo: *See*—
Arii, Kazuhiro; Yamamoto, Yasuo; Sumida, Nobuyuki; Hanaoka, Katsumi; and Tanaka, Kazuhiro, 4,631,509, Cl. 336-92.000.
Yamamura, Yutaka: *See*—
Tsumura, Akio; Hayashi, Shun-ichi; Miyaake, Chiharu; Oouchi, Kazuo; and Yamamura, Yutaka, 4,631,110, Cl. 156-584.000.
Yamanaka, Hideaki: *See*—
Takaya, Takao; Sakane, Kazuo; Yamanaka, Hideaki; and Miyai, Kenzi, 4,631,274, Cl. 514-202.000.
Yamanami, Tsuguya: *See*—
Taguchi, Yoshinori; and Yamanami, Tsuguya, 4,631,356, Cl. 178-19.000.
Yamanishi, Eiichi, to Kabushiki Kaisha Toshiba. Image forming apparatus displaying the steps of the image forming process. 4,631,577, Cl. 358-75.000.
Yamanoue, Kouichi; and Kitagawa, Junji, to Nippon Soken, Inc. Portable transmitter which conserves transmitter power by storing charges from previous pulses. 4,631,736, Cl. 375-71.000.
Yamashita, Hisao: *See*—
Mizumoto, Mamoru; Yamashita, Hisao; Matsuda, Shinpei; and Yamaguchi, Kazuhiko, 4,631,263, Cl. 502-159.000.
Yamashita, Sadahiko: *See*—
Makimoto, Mitsuo; Endo, Haruyoshi; and Yamashita, Sadahiko, 4,631,506, Cl. 333-224.000.
Yamazaki, Harumichi: *See*—
Ushijima, Takao; and Yamazaki, Harumichi, 4,630,808, Cl. 267-140.100.
Yamazaki, Hozo: *See*—
Yoshimura, Syushichi; Kobayashi, Hiromu; Toyonaga, Yoshikazu; Yamazaki, Hozo; and Karatsu, Masanori, 4,631,180, Cl. 423-450.000.
Yamazaki, Masafumi: *See*—
Suzuki, Mikio; and Yamazaki, Masafumi, 4,630,583, Cl. 123-425.000.
Yanada, Shigeo: *See*—
Masumoto, Mituhiko; Yanada, Shigeo; Izumida, Toshiaki; and Akahori, Kazuyuki, 4,631,334, Cl. 528-202.000.
Yanagisawa, Fukashi: *See*—
Kobayashi, Akira; and Yanagisawa, Fukashi, 4,631,610, Cl. 360-104.000.
Yankeelov, John A., Jr.; and Fok, Kam-Fook, to Research Corporation. Therapeutically useful pseudopeptides, compositions containing the same and methods of preparation and use. 4,631,270, Cl. 514-15.000.
Yano, Hiroshi. Toy gun. 4,630,757, Cl. 222-79.000.
Yano, Kenji: *See*—
Mabuchi, Akira; Yano, Kenji; and Mizuno, Hisashi, 4,631,206, Cl. 427-340.000.
Yano, Tadashi; and Okamoto, Arifumi, to Mitsubishi Jukogyo Kabushiki Kaisha. Delivery device for sheet bodies. 4,630,812, Cl. 271-132.000.
Yardney Corporation: *See*—
Haggett, Irving C., 4,631,383, Cl. 219-78.010.
Yashima, Nobuyoshi: *See*—
Oshima, Masanao; and Yashima, Nobuyoshi, 4,630,969, Cl. 405-217.000.
Yasuhara, Hiroto: *See*—
Watanabe, Kainen; Yasuhara, Hiroto; Sugiyama, Toru; Shimizu, Keiji; and Murata, Yoshihiro, 4,630,772, Cl. 238-159.000.
Yasumura, Takashi: *See*—
Koishi, Toshio; and Yasumura, Takashi, 4,631,326, Cl. 526-249.000.
Yasuoka, Hirotoshi, to Mitsubishi Denki Kabushiki Kaisha. Backlash correcting device for swivel arm of robot. 4,630,496, Cl. 74-409.000.
Yeda Research & Development Co. Limited: *See*—
Shanzer, Abraham; and Libman, Jacqueline, 4,631,291, Cl. 514-450.000.
Yee, David H. B.: *See*—
Mazumder, Nikhil C.; and Yee, David H. B., 4,631,427, Cl. 307-455.000.
Yeh, An-I: *See*—
Berg, Lloyd; and Yeh, An-I, 4,631,115, Cl. 203-19.000.
Yerazunis, William S.: *See*—
Thomas, Charles E.; Lee, Minyoung; Bedard, James F.; Hayashi, Steven R.; and Yerazunis, William S., 4,631,683, Cl. 364-474.000.
Yokogawa Medical Systems, Limited: *See*—
Yamaguchi, Keiki; Higashiizumi, Takao; Shimazaki, Toru; Sano, Shinichi; and Takeuchi, Yasuhito, 4,631,710, Cl. 367-103.000.
Yokouchi, Hiroshi, to Oki Electric Industry Co., Ltd. Microprocessor having a programmable logic array. 4,631,665, Cl. 364-200.000.
Yokoyama, Nobuaki: *See*—
Imazeki, Kazuyoshi; and Yokoyama, Nobuaki, 4,631,377, Cl. 200-314.000.
Yokoyama, Shizuo: *See*—
Kawakubo, Toshio; Ishikawa, Chuji; and Yokoyama, Shizuo, 4,630,814, Cl. 271-272.000.
Yomtov, Barry M., to Cordis Corporation. Apparatus for measuring impedance. 4,630,615, Cl. 128-734.000.
Yonex Kabushiki Kaisha: *See*—
Yoneyama, Minoru, 4,630,827, Cl. 273-169.000.
Yoneyama, Minoru, to Yonex Kabushiki Kaisha. Golf club head. 4,630,827, Cl. 273-169.000.
Yoshida, Hidemi: *See*—
Hase, Takashi; Yoshida, Hidemi; Suzuki, Hideo; and Hayakawa, Morio, 4,631,445, Cl. 313-467.000.
Yoshida, Kunio; and Makino, Fusao, to Sharp Kabushiki Kaisha. Enlarged pattern generator. 4,630,947, Cl. 400-124.000.
Yoshida, Masato: *See*—
Kobayashi, Michio; Yoshida, Masato; Sawada, Hideo; Hagii, Hidehiko; and Aoshima, Kazuyoshi, 4,631,151, Cl. 260-408.000.
Yoshida, Yasuharu, to NEC Corporation. QAM demodulator with distortion compensation. 4,631,488, Cl. 329-50.000.
Yoshihara, Noriyuki: *See*—
Yamabe, Masaaki; Kobayashi, Shigeyoshi; Yoshihara, Noriyuki; and Nakamura, Masaru, 4,631,075, Cl. 55-158.000.

Yoshikawa, Kiyomitsu: *See*—
Hirakawa, Tadashi; Yoshikawa, Kiyomitsu; Yoshioka, Shigenari; and Sasashige, Hiroaki, 4,631,109, Cl. 156-472.000.
Ohmori, Shunji; Takenaka, Hiroyuki; Hozoji, Akira; Kono, Kazunori; Yoshikawa, Kiyomitsu; and Kajihara, Seishi, 4,630,514, Cl. 83-342.000.

Yoshimoto, Masato; and Ohwaki, Shinji, to Teijin Limited. Process for producing a hollow irregular multifilament yarn. 4,631,162, Cl. 264-167.000.

Yoshimura, Syushichi; Kobayashi, Hiromu; Toyonaga, Yoshikazu; Yamazaki, Hozo; and Karatsu, Masanori, to Mitsubishi Chemical Industries Ltd. Process for producing carbon black. 4,631,180, Cl. 423-450.000.

Yoshino, Hisao: *See*—
Yamamoto, Ikuo; Umino, Takehito; Shinoda, Yoshio; and Yoshino, Hisao, 4,631,172, Cl. 420-541.000.

Yoshioka, Shigenari: *See*—
Hirakawa, Tadashi; Yoshikawa, Kiyomitsu; Yoshioka, Shigenari; and Sasashige, Hiroaki, 4,631,109, Cl. 156-472.000.

Yotsuyanagi, Takao; and Nishiyama, Yoshinobu, to Mitsubishi Chemical Industries Ltd. Method for recovering gallium. 4,631,177, Cl. 423-112.000.

Young, Ian R., to Picker International Limited. Nuclear magnetic resonance method and apparatus. 4,631,480, Cl. 324-309.000.

Young, Ian R.; Evans, Philip R.; and Luker, Peter A., to Picker International Limited. N.M.R. shims. 4,631,481, Cl. 324-320.000.

Young, James G.: *See*—
Colliopoulos, John A.; Young, James G.; and Tsau, Josef H., 4,631,195, Cl. 426-548.000.

Youssefyeh, Raymond D.: *See*—
Chakraborty, Utpal R.; and Youssefyeh, Raymond D., 4,631,287, Cl. 514-307.000.

Yui, Yuhi; and Kinashi, Hiroshi, to Sharp Kabushiki Kaisha. Image compensating method in a copying machine. 4,630,918, Cl. 355-3.00R.

Yuito, Isamu: *See*—
Shiiki, Kazuo; Shiroishi, Yoshihiro; Yuito, Isamu; Shinagawa, Kiminari; Uesaka, Yasutaro; Fujiwara, Hideo; and Nakamura, Hitoshi, 4,631,612, Cl. 360-125.000.

Yukawa, Shinjiro, to Nissan Motor Company, Limited. Sound-absorbing structure in vehicular compartment. 4,630,707, Cl. 181-288.000.

Zago, Giovanni; and Prataviera, Giovanni. Cleaning cassette for tape recorder and/or player magnetic head. 4,631,616, Cl. 360-128.000.

Zahnraderfabrik Renk Aktiengesellschaft: *See*—
Kugler, Artur; Reppert, Rudi; and Zaunberger, Franz-Xaver, 4,630,507, Cl. 74-733.000.

Zanchi, Vittorio: *See*—
Zulian, Ferruccio; and Zanchi, Vittorio, 4,631,667, Cl. 364-200.000.

Zansky, Zoltan: *See*—
Jacobsen, William F. M.; and Zansky, Zoltan, 4,631,675, Cl. 364-400.000.

Zaunberger, Franz-Xaver: *See*—
Kugler, Artur; Reppert, Rudi; and Zaunberger, Franz-Xaver, 4,630,507, Cl. 74-733.000.

Zborovsky, Ilya: *See*—
Sherman, Victor; and Zborovsky, Ilya, 4,630,671, Cl. 165-61.000.

Zeiler, Hans-Joachim: *See*—
Hartwig, Wolfgang; Habich, Dieter; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,631,275, Cl. 514-210.000.
Lockhoff, Oswald; Kruger, Bernd-Wieland; Stadler, Peter; Metzger, Karl G.; Kroll, Hein-Peter; Schaller, Klaus; and Zeiler, Hans-Joachim, 4,631,272, Cl. 514-23.000.

Zeitz, Vernon, to Ivek Corporation. Electro-optical fluid detector. 4,631,529, Cl. 340-619.000.

Zeller, Clifford L. Low calorie dairy product. 4,631,196, Cl. 426-580.000.

Zelmanovic, David; and Kishner, Stanley J., to Kollmorgen Technologies Corporation. Method of simultaneously determining gauge and orientation of polymer films. 4,631,408, Cl. 250-339.000.

Zemke, Ronald O.: *See*—
Welygan, Dennis G.; and Zemke, Ronald O., 4,631,215, Cl. 428-105.000.

Zenith Electronics Corporation: *See*—
Brugliera, Vito; Green, George R. J.; and Long, Michael E., 4,631,601, Cl. 358-335.000.
Turner, Rudolf, 4,631,587, Cl. 358-148.000.

Zettek, Charles M. Other time instrument. 4,630,935, Cl. 368-41.000.

Zettier, Karl H., to Westfalia Separator AG. Centrifuge for clarifying or separating suspensions. 4,631,049, Cl. 494-71.000.

ZF-Herion-Systemtechnik GmbH: *See*—
Voss, Thomas, 4,631,722, Cl. 371-9.000.

Zimmerman, Karen A.; Weston, Randall L.; and Thomas, Richard D., to Chrysler Motors Corporation. Seat belt testing device. 4,630,472, Cl. 73-161.000.

Zimmerman, Thomas A., to TRW Inc. Multiple path signal distribution to large scale integration chips. 4,631,572, Cl. 357-74.000.

Zinser Textilmaschinen GmbH: *See*—
Igel, Wolfgang, 4,630,435, Cl. 57-281.000.

Zoludow, Richard S., to Dwyer Instruments, Inc. Diaphragm operated switch type bin level sensor. 4,631,374, Cl. 200-61.210.

Zulian, Ferruccio; and Zanchi, Vittorio, to Honeywell Information Systems Italia. Asynchronous bus multiprocessor system. 4,631,667, Cl. 364-200.000.

Zuranski, Edward: *See*—
Betts, William L.; and Zuranski, Edward, 4,631,738, Cl. 375-98.000.

Zvi, Zadok; Kendi, Abraham; and Tal-Mor, Emile, to Kendi Security, Inc. Security gate apparatus. 4,630,396, Cl. 49-55.000.

Zweiniger, Hansjurgen; and Willenbrock, Horst, to Ford Motor Company. Storage apparatus for motor vehicles. 4,630,857, Cl. 296-37.120.

Zwicker, Walter K.: *See*—
Shaulov, Avner A.; Lukasik, Stanley J.; Frommer, Myron H.; and Zwicker, Walter K., 4,631,633, Cl. 361-321.000.

Zychal, Craig, to Amoco Corporation. Defoamer and antifoamer composition and method for defoaming aqueous fluid systems. 4,631,145, Cl. 252-321.000.

Zylstra, Henry J.: *See*—
Dvorak, Robert F.; Jansen, Harley W.; and Zylstra, Henry J., 4,631,624, Cl. 361-89.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF DECEMBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Crates, Fred J.; Fouss, James L.; and Parker, John J., to Hancor, Inc. Inlet and outlet baffle structure for sewage treatment tanks. Re. 32,312, Cl. 210-532.200.

Fouss, James L.: *See*—
Crates, Fred J.; Fouss, James L.; and Parker, John J., Re. 32,312, Cl. 210-532.200.

Gittins, Derek R.; and Gregory, Michael D., to Racal-Dana Instruments Limited. Frequency control circuits such as for use in modulation measurement. Re. 32,314, Cl. 455-115.000.

Gregory, Michael D.: *See*—
Gittins, Derek R.; and Gregory, Michael D., Re. 32,314, Cl. 455-115.000.

Hancor, Inc.: *See*—
Crates, Fred J.; Fouss, James L.; and Parker, John J., Re. 32,312, Cl. 210-532.200.

Hitachi, Ltd.: *See*—
Yamakido, Kazuo, Re. 32,313, Cl. 340-347.0DA.

Parker, John J.: *See*—
Crates, Fred J.; Fouss, James L.; and Parker, John J., Re. 32,312, Cl. 210-532.200.

Racal-Dana Instruments Limited: *See*—
Gittins, Derek R.; and Gregory, Michael D., Re. 32,314, Cl. 455-115.000.

Yamakido, Kazuo, to Hitachi, Ltd. Digital-to-analog converter and PCM encoder using the converter. Re. 32,313, Cl. 340-347.0DA.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Chiba, Ko; Yamauchi, Hajime; Kawauchi, Yoneo; and Ikeda, Yukio, to Kabushiki Kaisha Riken. Spacer and expander member for holding and biasing piston ring rails. B1 4,429,885, 12-23-86, Cl. 277-140.000.

Ikeda, Yukio: *See*—
Chiba, Ko; Yamauchi, Hajime; Kawauchi, Yoneo; and Ikeda, Yukio, B1 4,429,885, Cl. 277-140.000.

Kabushiki Kaisha Riken: *See*—
Chiba, Ko; Yamauchi, Hajime; Kawauchi, Yoneo; and Ikeda, Yukio, B1 4,429,885, Cl. 277-140.000.

Kasica, James J.: *See*—
Trubiano, Paolo C.; and Kasica, James J., B1 4,551,177, Cl. 106-210.000.

Kawauchi, Yoneo: *See*—
Chiba, Ko; Yamauchi, Hajime; Kawauchi, Yoneo; and Ikeda, Yukio, B1 4,429,885, Cl. 277-140.000.

National Starch and Chemical Corporation: *See*—
Trubiano, Paolo C.; and Kasica, James J., B1 4,551,177, Cl. 106-210.000.

Trubiano, Paolo C.; and Kasica, James J., to National Starch and Chemical Corporation. Compressible starches as binders for tablets or capsules. B1 4,551,177, 12-23-86, Cl. 106-210.000.

Yamauchi, Hajime: *See*—
Chiba, Ko; Yamauchi, Hajime; Kawauchi, Yoneo; and Ikeda, Yukio, B1 4,429,885, Cl. 277-140.000.

LIST OF DESIGN PATENTEES

Abe, Takeshi: *See*—
Shibayama, Masato; Abe, Takeshi; Ida, Daijiro; Ohshiro, Masayuki; Takahashi, Ichiro; Hashimoto, Yasuhiro; Hujisawa, Humio; and Araya, Takeshi, 287,368, Cl. D15-199.000.

Allen, David A.; and Diekman, Robert L., to Huffy Corporation. Tricycle seat. 287,317, 12-23-86, Cl. D6-354.000.

Allison, Darris E. Planing boat. 287,357, 12-23-86, Cl. D12-314.000.

American Greetings Corporation: *See*—
Cavnar, Kathryn A.; and Toth, Stephen M., 287,380, Cl. D21-111.000.
Edmisson, Russell C.; Eicher, Charlotte A.; and Toth, Stephen M., 287,379, Cl. D21-109.000.

AMP Incorporated: *See*—
Monroe, Kevin T., 287,331, Cl. D8-98.000.

Anastassiades, James C.; and Maser, Elliott D. Novelty tooth figure. 287,382, 12-23-86, Cl. D21-155.000.

Anderson, Kent R., to Larken Industries, Ltd. Alcohol applicator bottle. 287,335, 12-23-86, Cl. D9-338.000.

Araya, Takeshi: *See*—
Shibayama, Masato; Abe, Takeshi; Ida, Daijiro; Ohshiro, Masayuki; Takahashi, Ichiro; Hashimoto, Yasuhiro; Hujisawa, Humio; and Araya, Takeshi, 287,368, Cl. D15-199.000.

Architectural Structures Inc.: *See*—
Johansson, Lars-Gunnar, 287,409, Cl. D26-40.000.
Johansson, Lars-Gunnar, 287,410, Cl. D26-40.000.

Atlas Copco AB: *See*—
Karden, Karl G.; and Berger, Karl-Gustav, 287,330, Cl. D8-62.000.

Bekooy, Jan T. Refolding and stacking receptacle for segmental sheet material. 287,371, 12-23-86, Cl. D18-22.000.

Bell, Reginald R.: *See*—
Oliver, Morris A.; and Bell, Reginald R., 287,387, Cl. D21-191.000.

Berger Industries, Inc.: *See*—
Shemtov, Sami, 287,396, Cl. D23-47.000.

Berger, Karl-Gustav: *See*—
Karden, Karl G.; and Berger, Karl-Gustav, 287,330, Cl. D8-62.000.

Bergkvist, Hakan K.: *See*—
Johansson, Jan-Erik; and Bergkvist, Hakan K., 287,404, Cl. D24-34.000.

Biesecker, Frederick N., to Drug Plastics & Glass Company, Inc. Bottle. 287,338, 12-23-86, Cl. D9-355.000.

Blue Ridge Industrial Support Company: *See*—
Woods, Gerald, 287,367, Cl. D15-12.000.

Brennan, Mike: *See*—
Stoll, Scott A.; and Brennan, Mike, 287,370, Cl. D18-7.000.

Bristol-Myers Company: *See*—
Dominski, Daniel M., 287,339, Cl. D9-377.000.

Brittner, Maureen F.: *See*—
Brittner, Stephen L.; and Brittner, Maureen F., 287,392, Cl. D21-221.000.

Brittner, Stephen L.; and Brittner, Maureen F. Golf club head cover. 287,392, 12-23-86, Cl. D21-221.000.

Brocils, John, to Maddak, Inc. Raised superimposed toilet seat or the like. 287,399, 12-23-86, Cl. D23-71.000.

Brown, Frederick D. Pager carrying case. 287,305, 12-23-86, Cl. D3-106.000.

Bussell, Vanda J. Toothbrush holder. 287,320, 12-23-86, Cl. D6-534.000.

Bussell, Vanda J. Soap dish. 287,321, 12-23-86, Cl. D6-539.000.

Bussell, Vanda J. Tumbler. 287,323, 12-23-86, Cl. D7-12.000.

Bussell, Vanda J. Bud vase. 287,346, 12-23-86, Cl. D11-151.000.

Cable Electric Products, Inc.: *See*—
Schwartz, Frederic W., 287,358, Cl. D13-30.000.

Cain, Ann S., to 'totes', incorporated. Umbrella handle. 287,306, 12-23-86, Cl. D3-12.000.

Cain, Ann S., to 'totes', incorporated. Umbrella handle. 287,307, 12-23-86, Cl. D3-12.000.

Cain, Michael W., to Michelin Recherche et Technique S.A. Tire. 287,351, 12-23-86, Cl. D12-147.000.

Cain, Michael W., to Michelin Recherche et Technique S.A. Tire. 287,352, 12-23-86, Cl. D12-151.000.

Canon Kabushiki Kaisha: *See*—
Kando, Masahiro, 287,364, Cl. D14-94.000.

Cavalli, Alfredo. Food processor. 287,327, 12-23-86, Cl. D7-384.000.

Cavnar, Kathryn A.; and Toth, Stephen M., to American Greetings Corporation. Toy telephone. 287,380, 12-23-86, Cl. D21-111.000.

Charles, Mark E.; and Connella, Stephan J. Seamless crochet game footbag. 287,390, 12-23-86, Cl. D21-204.000.

Cheng, William, to Hung, Michael. Rowing exercise machine or similar article. 287,388, 12-23-86, Cl. D21-195.000.

Chipman-Union, Inc.: *See*—
Hagen, Carl E., 287,366, Cl. D2-331.000.

Combi Co., Ltd.: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Fujiyama, Tetumi, 287,405, Cl. D24-40.000.

Conair Corporation: *See*—
Ling, Gabriel T. Y., 287,419, Cl. D32-18.000.
Rittenhouse, James M.; Haber, Barry M.; and Wong, Ting W., 287,362, Cl. D14-53.000.

Connella, Stephan J.: *See*—
Charles, Mark E.; and Connella, Stephan J., 287,390, Cl. D21-204.000.

Continental Engineering Group, Inc.: *See*—
Ugalde, Carlos V., 287,319, Cl. D6-474.000.

Cooper Industries, Inc.: *See*—
Kusmer, Raymond J.; and Tinley, Raymond K., 287,413, Cl. D26-65.000.

Cornwell, Paul D., to Import Auto Products, Ltd. Dashboard cover. 287,353, 12-23-86, Cl. D12-192.000.

Cornwell, Paul D., to Import Auto Products, Ltd. Dashboard cover. 287,354, 12-23-86, Cl. D12-192.000.

Cornwell, Paul D., to Import Auto Products, Ltd. Dashboard cover. 287,355, 12-23-86, Cl. D12-192.000.

Cornwell, Paul D., to Import Auto Products, Ltd. Dashboard cover. 287,356, 12-23-86, Cl. D12-192.000.

Cramer, Charles W. Ashtray. 287,415, 12-23-86, Cl. D27-22.000.

Curtis Manufacturing Company, Inc.: *See*—
Judd, Thomas W., 287,365, Cl. D14-114.000.

Cuttriss, Richard J., to Gruber Systems, Inc. Bathtub. 287,397, 12-23-86, Cl. D23-55.000.

Danfoss A/S: *See*—
Lehmann, Kjeld, 287,360, Cl. D13-40.000.

Dart Industries Inc.: *See*—
Schmidt, Janice L., 287,324, Cl. D7-50.000.
Schmidt, Janice L., 287,325, Cl. D7-50.000.

Denver Mineral Exploration Corp.: *See*—
Kober, Carl L.; and Procter-Gregg, H. David, 287,342, Cl. D10-75.000.

Diekman, Robert L.: *See*—
Allen, David A.; and Diekman, Robert L., 287,317, Cl. D6-354.000.

Dinand, Pierre, to Saint-Gobain Desjonqueres. Bottle. 287,340, 12-23-86, Cl. D9-401.000.

Distinctive Appliances, Inc.: *See*—
Joseph, Stanley M., 287,326, Cl. D7-346.000.

Dixon, Linda H. Hip abduction pillow. 287,406, 12-23-86, Cl. D24-64.000.

Dr. Miller's Health Care Products, Inc.: *See*—
Miller, Griffith C., 287,309, Cl. D4-119.000.
Miller, Griffith C., 287,310, Cl. D4-119.000.
Miller, Griffith C., 287,311, Cl. D4-119.000.

Dominski, Daniel M., to Bristol-Myers Company. Packaging container for a pharmaceutical vial. 287,339, 12-23-86, Cl. D9-377.000.

Domon, Yoshihiro: *See*—
Fujita, Toshiharu; Domon, Yoshihiro; and Takizawa, Fuminobu, 287,407, Cl. D26-3.000.

Don Oliver Barbell (1977) Limited: *See*—
Oliver, Morris A.; and Bell, Reginald R., 287,387, Cl. D21-191.000.

Drane, John H., to Duracell Inc. Hand torch. 287,411, 12-23-86, Cl. D26-46.000.

Drug Plastics & Glass Company, Inc.: *See*—
Biesecker, Frederick N., 287,338, Cl. D9-355.000.

Duracell Inc.: *See*—
Drane, John H., 287,411, Cl. D26-46.000.

Edmisson, Russell C.; Eicher, Charlotte A.; and Toth, Stephen M., to American Greetings Corporation. Toy clock. 287,379, 12-23-86, Cl. D21-109.000.

Eicher, Charlotte A.: *See*—
Edmisson, Russell C.; Eicher, Charlotte A.; and Toth, Stephen M., 287,379, Cl. D21-109.000.

Emmons, Marvin L. Novelty digital calculator. 287,376, 12-23-86, Cl. D21-59.000.

Ernst Leitz Wetzlar G.m.b.H.: *See*—
Janke, Heinrich; Hengst, Alfred; and Uellenberg, Hans-Kurt, 287,369, Cl. D16-133.000.

Etablissements Regnault: *See*—
Regnault, Pierre, 287,373, Cl. D19-43.000.

Etna Products Co., Inc.: *See*—
Fung, May, 287,412, Cl. D26-60.000.

F.I.R. Rubinetterie S.p.A.: *See*—
Piesco, Nazzareno, 287,395, Cl. D23-32.000.

Ferrero, Pietro, to Ferrero S.p.A. Packaging container for candy or the like. 287,334, 12-23-86, Cl. D9-318.000.

Ferrero S.p.A.: *See*—
Ferrero, Pietro, 287,334, Cl. D9-318.000.

Fisher, Myles A.; and Justin, Joseph S. Portable shower. 287,398, 12-23-86, Cl. D23-57.000.

Foggia, Donald: *See*—
Klaiber, Gerhart F.; and Foggia, Donald, 287,363, Cl. D14-62.000.

Fujita, Toshiharu; Domon, Yoshihiro; and Takizawa, Fuminobu, to Mitsubishi Denki Kabushiki Kaisha. Fluorescent lamp. 287,407, 12-23-86, Cl. D26-3.000.

Fujiyama, Tetumi: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Fujiyama, Tetumi, 287,405, Cl. D24-40.000.

Fung, May, to Etna Products Co., Inc. Portable reading light. 287,412, 12-23-86, Cl. D26-60.000.

Gaines, Donald R. Sensor night light. 287,408, 12-23-86, Cl. D26-26.000.

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Ginouves, Valeska. Combined chair and step stool. 287,315, 12-23-86, Cl. D6-335.000.

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Grun, Otto. Aquatic sculpture or similar article. 287,347, 12-23-86, Cl. D11-157.000.

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Hagen, Carl E., to Chipman-Union, Inc. Sock. 287,366, 12-23-86, Cl. D2-331.000.

Hamatani, George. Push rod holder for diesel engine with installed aftercooler. 287,329, 12-23-86, Cl. D8-14.000.

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Henkels, Walter. Combined holder for note paper and a calendar. 287,372, 12-23-86, Cl. D19-22.000.

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CLASS 51

7	4,630,401
105 GG	4,630,402
	4,630,404
105 VG	4,630,403
163.2	4,630,405
285	4,630,406
309	4,631,072
322	4,630,407
337	4,630,408
361	4,630,409
410	4,630,410

CLASS 52

1	4,630,411
	4,630,412
98	4,630,413
220	4,630,414
221	4,630,415
239	4,630,416
263	4,630,417
264	4,630,418
309.13	4,630,419
313	4,630,420
408	4,630,421
410	4,630,422
484	4,630,423
693	4,630,424
745	4,630,425

CLASS 53

428	4,630,426
460	4,630,427
474	4,630,428
479	4,630,429

CLASS 55

18	4,631,073
27	4,631,074
158	4,631,075
283	4,631,076
487	4,631,077

CLASS 56

14.1	4,630,430
28	4,630,431
220	4,630,432

CLASS 57

22	4,630,433
87	4,630,434
281	4,630,435

CLASS 60

39.183	4,630,436
204	4,630,437
274	4,630,438
305	4,630,439
398	4,630,440
413	4,630,441
415	4,630,442
535	4,630,443
598	4,630,444
602	4,630,445
	4,630,446
712	4,630,447

CLASS 62

60	4,630,448
130	4,630,449
222	4,630,450
247	4,630,451

CLASS 63

12	4,630,452
	4,630,453

CLASS 65

3.11	4,631,078
109	4,631,079
134	4,631,080

CLASS 66

1 A	4,630,454
172 R	4,630,455

CLASS 70

232	4,630,456
369	4,630,457

CLASS 71

94	4,631,081

CLASS 72

237	4,630,458
391	4,630,460
405	4,630,461
410	4,630,462
479	4,630,463

CLASS 73

28	4,630,464
35	4,630,465
38	4,630,466
49.2	4,630,467
59	4,630,468
61.1 C	4,630,469
146.2	4,630,470
146.5	4,630,471
161	4,630,472
	4,630,473
196	4,630,474
293	4,630,475
	4,630,476
295	4,630,477
299	4,630,478
431	4,630,480
437	4,630,481
597	4,630,482
652	4,630,483
861.22	4,630,484
861.56	4,630,485
	4,630,486
861.76	4,630,487
861.81	4,630,488
861.87	4,630,489
862.65	4,630,490
862.67	4,630,491
863.82	4,630,492
863.83	4,630,479

CLASS 74

22 R	4,630,493
191	4,630,494
	4,630,495
409	4,630,496
425	4,630,497
445	4,630,498
473 R	4,630,499
	4,630,500
484 R	4,630,501
551.1	4,630,502
594.2	4,630,503
689	4,630,504
711	4,630,505
713	4,630,506
733	4,630,507
866	4,630,508

CLASS 75

235	4,631,082

CLASS 76

37	4,630,509

CLASS 81

55	4,630,510
462	4,630,511
475	4,630,512

CLASS 83

152	4,630,513
342	4,630,514
402	4,630,515
530	4,630,516

CLASS 84

1.01	4,630,517
1.03	4,630,518
	4,630,519
1.16	4,630,520
413	4,630,521

CLASS 89

1.14	4,630,522

CLASS 91

1	4,630,523
219	4,630,524
369 A	4,630,525
449	4,630,527
452	4,630,526
491	4,630,528

CLASS 92

13	4,630,529

CLASS 98

2.11	4,630,530
52	4,630,531

CLASS 99

279	4,630,532
353	4,630,533
483	4,630,534

CLASS 100

127	4,630,535
229 R	4,630,536

CLASS 101

3 R	4,630,537
45	4,630,538

CLASS 102

202	4,630,539
307	4,630,540

CLASS 104

7.2	4,630,541
114	4,630,542
173.1	4,630,543

CLASS 105

130	4,630,544
329.1	4,630,545
416	4,630,546
	4,630,547
	4,630,548

CLASS 106

14.23	4,631,083
21	4,631,084
22	4,631,085
36	4,631,086
210	B1 4,551,177
252	4,631,087
273 R	4,631,088
304	4,631,089
	4,631,090
308 N	4,631,091

CLASS 108

111	4,630,549
155	4,630,550
159	4,630,551

CLASS 110

190	4,630,552
214	4,630,553
264	4,630,554
346	4,630,555
347	4,630,556

CLASS 112

235	4,630,557
266.2	4,630,558
291	4,630,559
302	4,630,560

CLASS 114

1	4,630,561
39	4,630,562
	4,630,563
98	4,630,564

CLASS 118

47	4,630,565
50.1	4,630,566
323	4,630,567
723	4,630,568

CLASS 119

1	4,630,569
20	4,630,570
29	4,630,571

CLASS 123

41.21	4,630,572
41.27	4,630,573
	4,630,574
52 M	4,630,575
65 S	4,630,591
90.36	4,630,576
179 B	4,630,577
179 G	4,630,578
195 R	4,630,579
196 R	4,630,580
325	4,630,581
339	4,630,582
425	4,630,583
	4,630,584
438	4,630,585
500	4,630,586
502	4,630,587
506	4,630,588
571	4,630,589
602	4,630,590

CLASS 126

4	4,630,592
25 R	4,630,593
64	4,630,594
417	4,630,595

CLASS 128

1 D	4,630,597
1 R	4,630,596
7	4,630,598
66	4,630,599
80 R	4,630,600
92 YZ	4,630,601
127	4,630,602
156	4,630,603
205.24	4,630,605
206.15	4,630,604
207.14	4,630,606
328	4,630,607
335	4,630,608
344	4,630,609
501	4,630,610
642	4,630,611
660	4,630,612
687	4,630,613
721	4,630,614
734	4,630,615
753	4,630,616
784	4,630,617

CLASS 131

84.3	4,630,618
296	4,630,619
331	4,630,620

CLASS 132

7	4,630,621
39	4,630,622
89	4,630,623

CLASS 133

4 A	4,630,624

CLASS 134

104	4,630,625

CLASS 135

84	4,630,626
112	4,630,627

CLASS 136

225	4,631,350
244	4,631,351
249	4,631,352

CLASS 137

12	4,630,628
15	4,630,629
68.1	4,630,630
85	4,630,631
	4,630,632
185	4,630,633
268	4,630,634
315	4,630,635
	4,630,636
340	4,630,637
381	4,630,638
486	4,630,639
501	4,630,640
505.38	4,630,641
506	4,630,642
597	4,630,643
624.11	4,630,644
625.6	4,630,645

CLASS 138

96 R	4,630,646
99	4,630,647
103	4,630,648
122	4,630,649
154	4,630,650

CLASS 139

446	4,630,651

CLASS 140

92.1	4,630,652

CLASS 141

83	4,630,653
	4,630,654
198	4,630,655

CLASS 144

134 D	4,630,656
144.5 GT	4,630,657
176	4,630,658
193 R	4,630,659
363	4,630,660

CLASS 148

3	4,631,092
6.1	4,631,093
11.5 F	4,631,094
12 F	4,631,095

CLASS 149

1	4,631,096

CLASS 152

209 R	4,630,661
397	4,630,662
541	4,630,663

CLASS 156

44	4,631,097
86	4,631,098
89	4,631,099
150	4,631,100
175	4,631,101
210	4,631,102
241	4,631,103
293	4,631,104
345	4,631,105
	4,631,106
359	4,631,107
461	4,631,108
472	4,631,109
584	4,631,110
630	4,631,111
644	4,631,112
659.1	4,631,113
663	4,631,114

CLASS 160

232 4,630,664

CLASS 164

97 4,630,665
155 4,630,666
363 4,630,667
437 4,630,668

CLASS 165

1 4,630,669
16 4,630,670
61 4,630,671
95 4,630,672
147 4,630,674
158 4,630,673

CLASS 166

34.2 4,630,680
53 4,630,675
55 4,630,676
68 4,630,677
281 4,630,678
305.1 4,630,679
366 4,630,681

CLASS 169

38 4,630,682
45 4,630,683
46 4,630,684

CLASS 172

7 4,630,685
393 4,630,686

CLASS 173

131 4,630,687
163 4,630,688

CLASS 174

16 R 4,631,353
66 4,631,354

CLASS 175

56 4,630,689
57 4,630,690
65 4,630,691
330 4,630,692
366 4,630,693
391 4,630,694

CLASS 177

1 4,630,695
165 4,630,696
211 4,630,697

CLASS 178

18 4,631,355
19 4,631,356

CLASS 180

69.24 4,630,698
75 4,630,699
89.13 4,630,700
209 4,630,701
215 4,630,702
219 4,630,703
247 4,630,704
4,630,705
273 4,630,706

CLASS 181

288 4,630,707

CLASS 182

12 4,630,708
48 4,630,709
116 4,630,710

CLASS 184

6.12 4,630,711
15.3 4,630,712

CLASS 188

73.44 4,630,713
206 R 4,630,714
210 4,630,715
371 4,630,716

CLASS 190

104 4,630,717

CLASS 192

18 A 4,630,718
21 4,630,719
48.8 4,630,720
58 B 4,630,721
84 T 4,630,722
105 BA 4,630,723

CLASS 198

399 4,630,724
425 4,630,725
819 4,630,726

CLASS 200

19 DC 4,631,371
19 R 4,631,369
4,631,370
4,631,372
43.17 4,631,373
61.21 4,631,374
84 C 4,631,375
306 4,631,376
314 4,631,377
340 4,631,378

CLASS 203

19 4,631,115

CLASS 204

1 T 4,631,116
15 4,631,117
16 4,631,118
59 R 4,631,119
182.8 4,631,120
243 R 4,631,121
299 R 4,631,122

CLASS 206

221 4,630,727
313 4,630,728
363 4,630,729
392 4,630,730
425 4,630,731
445 4,630,732
459 4,630,733
461 4,630,734
611 4,630,735

CLASS 208

138 4,631,123

CLASS 209

3 4,631,124
215 4,631,125
587 4,630,736

CLASS 210

108 4,631,126
232 4,631,127
321.5 4,631,128
532.2 Re.32,312
635 4,631,129
651 4,631,130
697 4,631,131
727 4,631,132
739 4,631,133
758 4,631,134
764 4,631,135

CLASS 211

40 4,630,737
60.1 4,630,738
189 4,630,739
194 4,630,740

CLASS 212

203 4,630,741

CLASS 215

13 R 4,630,742
216 4,630,743

CLASS 219

10.55 A 4,631,380
10.57 4,631,381
69 R 4,631,382
78.01 4,631,383
121 P 4,631,384
124.03 4,631,385
125.12 4,631,386
272 4,631,387
326 4,631,388
421 4,631,389
449 4,631,390
541 4,631,391
549 4,631,392

CLASS 220

1 R 4,630,744
6 4,630,745
4,630,746
7 4,630,747
86 AT 4,630,748
86 R 4,630,749
324 4,630,750
334 4,630,751
404 4,630,752

CLASS 222

17 4,630,753
28 4,630,754
56 4,630,755
78 4,630,756
79 4,630,757
189 4,630,758
377 4,630,759
387 4,630,760
551 4,630,761

CLASS 223

66 4,630,762

CLASS 224

259 4,630,763

CLASS 225

2 4,630,764
96 4,630,765

CLASS 227

8 4,630,766

CLASS 228

122 4,630,767

CLASS 229

92.7 4,630,768

CLASS 232

1 D 4,630,769

CLASS 235

89 A 4,631,393

CLASS 236

34.5 4,630,770

CLASS 237

17 4,630,771

CLASS 238

159 4,630,772

CLASS 239

1 4,630,773
8 4,630,774
56 4,630,775
553.3 4,630,776
707 4,630,777

CLASS 241

1 4,630,778
4,630,779
46 B 4,630,780
159 4,630,781

CLASS 242

18 EW 4,630,782
56 A 4,630,783
56.1 4,630,784
72.1 4,630,785
96 4,630,786

CLASS 244

65 4,630,787
104 FP 4,630,788
135 R 4,630,789
169 4,630,790
173 4,630,791

CLASS 246

369 4,630,792

CLASS 248

102 4,630,793
309.1 4,630,794
318 4,630,795
648 4,630,796

CLASS 249

20 4,630,797
50 4,630,798

CLASS 250

201 4,631,394
4,631,395
4,631,396
4,631,397
216 4,631,398
221 4,631,399
4,631,400
227 4,631,401
231 R 4,631,402
237 G 4,631,403
4,631,404
266 4,631,405
327.2 4,631,407
338 4,631,406
339 4,631,408
361 R 4,631,409
363 R 4,631,410
374 4,631,411
381 4,631,412
458.1 4,631,413
474.1 4,631,414
497.1 4,631,415
548 4,631,416
578 4,631,417

CLASS 251

129.18 4,630,799
324 4,630,800

CLASS 252

8.5 M 4,631,136
8.514 4,631,137
8.555 4,631,138
49.3 4,631,139
62.56 4,631,140
95 4,631,141
184 4,631,142
299.62 4,631,143
301.4 R 4,631,144
321 4,631,145
522 R 4,631,146
4,631,147
609 4,631,148

CLASS 260

408 4,631,151
963 4,631,347

CLASS 261

4 4,631,152
52 4,631,153

CLASS 264

3.1 4,631,154
22 4,631,155
37 4,631,156
41 4,631,157
43 4,631,158
53 4,631,159
62 4,631,160
167 4,631,161
4,631,162
291 4,631,163

CLASS 266

216 4,630,801
225 4,630,802

CLASS 267

8 R 4,630,803
52 4,630,804
64.13 4,630,805
140.1 4,630,806
4,630,807
4,630,808
141.1 4,630,809
153 4,630,810

CLASS 269

10.55 F 4,631,379
118 4,630,811

CLASS 271

132 4,630,812
227 4,630,813
272 4,630,814
273 4,630,815

CLASS 272

70 4,630,816
73 4,630,817
4,630,818
113 4,630,819

CLASS 273

82 R 4,630,820
85 G 4,630,821
118 A 4,630,822
148 B 4,630,823
150 4,630,824
167 H 4,630,825
4,630,826
169 4,630,827
176 FB 4,630,828
186 A 4,630,829
240 4,630,830
292 4,630,831
374 4,630,832

CLASS 277

140 B1 4,429,885
188 A 4,630,833
212 FB 4,630,834
235 B 4,630,835

CLASS 279

19 4,630,836

CLASS 280

47.17 4,630,838
47.2 4,630,837
255 4,630,839
707 4,630,840
806 4,630,841
814 4,630,842

CLASS 281

30 4,630,843

CLASS 283

67 4,630,844
91 4,630,845

CLASS 285

21 4,630,846
29 4,630,847
55 4,630,849
308 4,630,848
322 4,630,850
341 4,630,851

CLASS 292

87 4,630,852
258 4,630,853
343 4,630,854

CLASS 294

81.21 4,630,855
81.53 4,630,856

CLASS 296

37.12 4,630,857
146 4,630,858
217 4,630,859
4,630,860

CLASS 297

44 4,630,861
167 4,630,862
219 4,630,863
232 4,630,864
284 4,630,865
361 4,630,866
452 4,630,867

CLASS 299

4 4,630,868
33 4,630,869

CLASS 303

24 A 4,630,870
113 4,630,871

CLASS 307

200 A 4,631,418
255 4,631,419
272 R 4,631,420
297 4,631,421
300 4,631,422
352 4,631,423
448 4,631,424
449 4,631,425
450 4,631,426
455 4,631,427
475 4,631,428
490 4,631,429

CLASS 310

12 4,631,430
13 4,631,431
14 4,631,432
89 4,631,433
112 4,631,434
156 4,631,435
322 4,631,436
369 4,631,437

CLASS 312

209 4,630,873

CLASS 313

359.1 4,631,438
402 4,631,439
403 4,631,440
408 4,631,441
414 4,631,442
417 4,631,443
420 4,631,444
467 4,631,445
634 4,631,446

CLASS 315

5 4,631,447
111.81 4,631,448
205 4,631,449
209 R 4,631,451
244 4,631,450
334 4,631,452
340 4,631,453
408 4,631,454

CLASS 318

37 4,631,455
140 4,631,456
254 4,631,457
4,631,458
4,631,459
280 4,631,460
4,631,461
318 4,631,462
558 4,631,463
563 4,631,464
565 4,631,465
696 4,631,466
798 4,631,467

CLASS 320

14 4,631,468

CLASS 322

42 4,631,469

CLASS 323

282 4,631,470
306 4,631,471
325 4,631,472

CLASS 324

71.4 4,631,483
72.5 4,631,473
73 R 4,631,474
102 4,631,475
103 R 4,631,476
207 4,631,477
4,631,478
212 4,631,479
309 4,631,480
320 4,631,481
454 4,631,482

CLASS 328

63 4,631,484

CLASS 329

50 4,631,485
4,631,486
4,631,487
4,631,488
110 4,631,489

CLASS 330

51 4,631,490
149 4,631,491
277 4,631,492
4,631,493
286 4,631,494
310 4,631,495

CLASS 331

1 A 4,631,496
4 4,631,497
9 4,631,498
11 4,631,499
51 4,631,500
143 4,631,501

CLASS 332

16 T 4,631,502

CLASS 333

24.1 4,631,503
25 4,631,504
33 4,631,505
224 4,631,506

CLASS 335

27 4,631,507
142 4,631,508

CLASS 336

92 4,631,509
135 4,631,510
180 4,631,511

CLASS 338

48 4,631,512

CLASS 339

17 CF 4,630,875
17 F 4,630,874
48 4,630,876
60 M 4,630,877
75 M 4,630,878
99 R 4,630,879
176 L 4,630,880
176 R 4,630,881
198 R 4,630,882

CLASS 340

52 R 4,631,513
4,631,514
62 4,631,515
76 4,631,516
326 4,631,517
333 4,631,366
347 CC 4,631,520
4,631,522
347 DA Re.32,313
4,631,518
347 DD 4,631,521
347 P 4,631,519
4,631,524
347 SY 4,631,523
365 S 4,631,525
396 4,631,526
539 4,631,527
545 4,631,528
619 4,631,529
679 4,631,530
701 4,631,531
703 4,631,532
721 4,631,533
825.5 4,631,534
856 4,631,535
857 4,631,536
870.17 4,631,537
870.18 4,631,538
870.29 4,631,539
870.38 4,631,540

CLASS 342

20 4,631,542
389 4,631,543

CLASS 343

5 DP 4,631,541
771 4,631,544
779 4,631,545
833 4,631,546
840 4,631,547

CLASS 346

1.1 4,631,548
4,631,549

4,631,550
108 4,631,551
136 4,631,552
140 R 4,631,553
4,631,554
4,631,555
4,631,556
4,631,557
4,631,558
160 4,631,559

CLASS 350

96.15 4,630,883
4,630,884
4,630,885
96.20 4,630,886
96.23 4,630,887
4,630,888
96.30 4,630,889
4,630,890
105 4,630,891
264 4,630,892
334 4,630,893
338 4,630,894
345 4,630,895
350 R 4,630,896
4,630,897
354 4,630,898
427 4,630,899
539 4,630,900
552 4,630,901
570 4,630,902
579 4,630,903
600 4,630,904
613 4,630,905

CLASS 351

159 4,630,906

CLASS 352

75 4,630,907

CLASS 353

94 4,630,908

CLASS 354

1 4,630,909
76 4,630,910
82 4,630,911
88 4,630,912
115 4,630,913
212 4,630,914
275 4,630,915
418 4,630,916
456 4,630,917

CLASS 355

3 R 4,630,918
3 SH 4,630,921
4 4,630,919
15 4,630,920
55 4,630,922

CLASS 356

301 4,630,923
316 4,630,924
318 4,630,925
357 4,630,926
372 4,630,927
374 4,630,928

CLASS 357

6 4,631,560
13 4,631,561
4,631,562
23.1 4,631,563
23.4 4,631,564
4,631,565
30 4,631,566
38 4,631,567
45 4,631,569
49 4,631,568
4,631,570
68 4,631,571
74 4,631,572
82 4,631,573

CLASS 358

12 4,631,574
30 4,631,575
65 4,631,576
75 4,631,577
80 4,631,578
4,631,579
88 4,631,580
93 4,631,581
98 4,631,582
125 4,631,583
141 4,631,584
148 4,631,585
4,631,586
4,631,587
149 4,631,588
171 4,631,589
185 4,631,590
190 4,631,591
213 4,631,592
4,631,593
231 4,631,594
243 4,631,595
256 4,631,596
258 4,631,597
280 4,631,598
285 4,631,599
320 4,631,600
335 4,631,601

CLASS 360

16 4,631,602
37.1 4,631,603
66 4,631,604
70 4,631,605
78 4,631,606
96.5 4,631,607
99 4,631,608
104 4,631,610
106 4,631,611
125 4,631,612
4,631,613
128 4,631,614
4,631,615
4,631,616
131 4,631,617
132 4,631,618
4,631,619
133 4,631,620
135 4,631,609

CLASS 361

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45 4,631,622
86 4,631,623
89 4,631,624
94 4,631,625
104 4,631,626
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154 4,631,628
4,631,629
212 4,631,630
306 4,631,631
315 4,631,632
321 4,631,633
358 4,631,634
383 4,631,635
385 4,631,636
413 4,631,637
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424 4,631,641

CLASS 362

32 4,631,642
97 4,631,643
105 4,631,644
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118 4,631,646
147 4,631,647
150 4,631,648
183 4,631,649
249 4,631,650
267 4,631,651

CLASS 363

16 4,631,652
17 4,631,653
21 4,631,654
50 4,631,655
123 4,631,656

CLASS 364

167 4,631,657
184 4,631,658
200 4,631,659
4,631,660
4,631,661
4,631,662
4,631,663
4,631,664
4,631,665
4,631,666
4,631,667
4,631,668
4,631,669
4,631,670
4,631,671
4,631,672
300 4,631,673
4,631,674
400 4,631,675
413 4,631,676
422 4,631,677
424 4,631,678
424.1 4,631,679
431.05 4,631,680
464 4,631,681
471 4,631,682
474 4,631,683
4,631,684
476 4,631,685
490 4,631,686
497 4,631,687
507 4,631,688
513 4,631,689
518 4,631,690
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521 4,631,691
550 4,631,693
608 4,631,694
715 4,631,695
748 4,631,696
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4,631,702
4,631,703

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126 4,631,704
182 4,631,705
215 4,631,706
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10 4,630,929
77 4,630,930
107 4,630,931
279 4,630,932

CLASS 367

2 4,631,708
4 4,631,709
103 4,631,710
149 4,631,711

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10 4,630,933
28 4,630,934
41 4,630,935
66 4,630,936
223 4,630,937

CLASS 369

44 4,631,712
54 4,631,713
59 4,631,714
68 4,631,715
75.2 4,631,716
276 4,631,717

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4 4,631,718
15 4,631,719
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9 4,631,722
10 4,631,723
21 4,631,724
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31 4,631,726
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38 4,631,728
44 4,631,729
50 4,631,730
74 4,631,731
87 4,631,732

CLASS 374

44 4,630,938
135 4,630,939
148 4,630,940

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98 4,631,738

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300 4,631,164
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446 4,631,167
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60 4,631,739
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113 4,631,742
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15 4,631,363
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15 4,631,745
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47 4,631,751

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266 4,630,959
345 4,630,960

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107 4,630,965

CLASS 405

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224 4,630,970
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65 4,630,976

CLASS 408

83.5 4,630,977
159 4,630,978

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232 4,630,979
234 4,630,980

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368 4,630,984
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32 4,630,987
327 4,630,988
401 4,630,989
462 4,630,990
478 4,630,991
744 R 4,630,992

CLASS 415

53 R 4,630,993
190 4,630,994

CLASS 416

7 4,630,995
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90 A 4,630,997
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CLASS 417

3 4,631,001
49 4,631,002
151 4,631,003
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218 4,631,005
225 4,631,000
234 4,631,006
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477 4,631,008

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68 4,631,011
70 4,631,012

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455 4,631,170
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541 4,631,172

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135 4,631,175

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88 4,631,191

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548 4,631,195
580 4,631,196

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68 4,631,214
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225 4,631,241

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569 4,631,253

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268 4,631,024
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37 4,631,255
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172.3 4,631,259

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100 4,631,037

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133 4,631,039

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250	4,631,313
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383	4,631,317
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509	4,631,323
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259	4,631,328
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9	4,631,051
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54	4,631,054
82	4,631,055
111	4,631,056
198	4,631,057
263	4,631,058
280	4,631,059
285	4,631,060
318	4,631,061
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		287,314
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	354	287,317
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	474	287,319
	534	287,320
	539	287,321
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	50	287,324
		287,325
	346	287,326
	384	287,327
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	105	287,332
	373	287,333
D9—	318	287,334
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	341	287,336
	349	287,337
	355	287,338
	377	287,339
	401	287,340
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D12—	119	287,348
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	151	287,352
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		287,354
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	94	287,364
	114	287,365
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	89	287,374
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	65	287,377
	87	287,378
	109	287,379
	111	287,380
	150	287,381
	155	287,382
	157	287,383
		287,384
		287,385
	189	287,386
	191	287,387
	195	287,388
		287,389
	204	287,390
	219	287,391
	221	287,392
	230	287,393
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	47	287,396
	55	287,397
	57	287,398
	71	287,399
	131	287,400
D24—	3	287,401
	10	287,402
	17	287,403
	34	287,404
	40	287,405
	64	287,406
D26—	3	287,407
	26	287,408
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	46	287,411
	60	287,412
	65	287,413
	139	287,414
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D28—	55	287,416
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01 :	4,630,474	4,630,692	4,631,435	4,630,955	4,631,580	4,631,264
	4,630,480	4,630,703	4,631,453	4,631,037	4,631,588	4,631,353
	4,630,539	4,630,730	4,631,463	4,631,082	4,631,636	4,631,363
	4,630,676	4,630,752	4,631,472	4,631,171	4,631,670	4,631,536
	4,630,683	4,630,763	4,631,474	4,631,316	4,631,737	4,631,573
	4,630,771	4,630,767	4,631,493	4,631,320	4,631,738	4,631,574
	4,631,121	4,630,790	4,631,498	4,631,335	4,631,750	4,631,587
	4,631,125	4,630,816	4,631,505	4,631,345	13 : 4,630,319	4,631,601
	4,631,631	4,630,824	4,631,516	4,631,354	4,630,455	4,631,648
04 :	4,630,323	4,630,825	4,631,524	4,631,383	4,630,717	4,631,655
	4,630,376	4,630,828	4,631,541	4,631,432	4,630,761	4,631,682
	4,630,385	4,630,829	4,631,568	4,631,528	4,630,913	4,631,745
	4,630,624	4,630,831	4,631,569	4,631,557	4,631,029	18 : 4,630,331
	4,630,672	4,630,838	4,631,572	4,631,621	4,631,604	4,630,443
	4,630,773	4,630,842	4,631,583	4,631,622	4,631,625	4,630,485
	4,630,898	4,630,843	4,631,586	4,631,634	15 : 4,630,326	4,630,506
	4,631,004	4,630,905	4,631,603	4,631,649	4,630,399	4,630,547
	4,631,092	4,630,907	4,631,613	4,631,681	4,630,562	4,630,657
	4,631,494	4,630,911	4,631,614	10 : 4,631,018	16 : 4,630,659	4,630,715
	4,631,532	4,630,923	4,631,647	4,631,111	17 : 4,630,384	4,630,743
	4,631,540	4,630,963	4,631,653	4,631,205	4,630,390	4,631,026
	4,631,570	4,630,978	4,631,657	4,631,244	4,630,417	4,631,044
	4,631,695	4,631,028	4,631,660	4,631,247	4,630,448	4,631,201
	4,631,733	4,631,041	4,631,666	4,631,602	4,630,457	4,631,279
05 :	4,630,964	4,631,060	4,631,673	11 : 4,631,186	4,630,461	4,631,339
	4,631,050	4,631,070	4,631,692	4,631,447	4,630,465	4,631,343
06 :	4,630,343	4,631,093	4,631,694	12 : 4,630,317	4,630,467	4,631,374
	4,630,367	4,631,094	4,631,727	4,630,346	4,630,497	4,631,595
	4,630,369	4,631,105	4,631,728	4,630,389	4,630,504	4,631,685
	4,630,423	4,631,113	4,631,729	4,630,391	4,630,530	19 : 4,630,420
	4,630,426	4,631,116	4,631,739	4,630,477	4,630,532	4,630,431
	4,630,427	4,631,123	4,631,740	4,630,576	4,630,536	4,630,526
	4,630,447	4,631,154	4,631,741	4,630,608	4,630,685	4,630,988
	4,630,473	4,631,191	08 : 4,630,397	4,630,615	4,630,695	4,631,624
	4,630,483	4,631,199	4,630,543	4,630,625	4,630,731	20 : 4,630,380
	4,630,510	4,631,202	4,631,073	4,630,640	4,630,733	4,630,991
	4,630,513	4,631,211	4,631,108	4,630,646	4,630,801	4,631,025
	4,630,517	4,631,235	4,631,160	4,630,656	4,630,830	4,631,530
	4,630,521	4,631,248	4,631,176	4,630,677	4,630,835	21 : 4,630,619
	4,630,540	4,631,257	4,631,192	4,630,709	4,630,837	4,631,217
	4,630,594	4,631,331	4,631,401	4,630,799	4,630,882	4,631,270
	4,630,600	4,631,332	4,631,534	4,630,844	4,630,984	4,631,300
	4,630,609	4,631,352	4,631,598	4,630,895	4,631,000	22 : 4,630,593
	4,630,622	4,631,365	4,631,605	4,631,008	4,631,007	4,630,636
	4,630,634	4,631,375	09 : 4,630,360	4,631,019	4,631,009	4,630,679
	4,630,638	4,631,385	4,630,362	4,631,020	4,631,052	4,630,694
	4,630,644	4,631,392	4,630,440	4,631,051	4,631,056	4,630,939
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	4,630,652	4,631,400	4,630,617	4,631,428	4,631,149	4,631,179
	4,630,675	4,631,416	4,630,655	4,631,483	4,631,161	4,631,258
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04 : 287,332
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21 : 5,838
24 : 5,835

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